THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. VI. Nº 127—9th YEAR.] LONDON, SEPTEMBER 1, 1857. [Subscription per Ann. 15s. in Advance 18s. Credit.] Price 8d. Unstamped.

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"Gentlemen,—I have much pleasure in informing you that the Jury has awarded to your firm 'HONOURABLE MENTION FOR LAP-WELDED IRON TUBES.' You are at full liberty, if you deem it likely to promote your mercantile advantage, to affix to these articles, during the season 1854, a card whereon this Award is printed, and also your prices, with name of agent, &c.—I am, gentlemen, your obedient servant,

"JOHN H. BOHN, Secretary.

"Messrs. JAMES RUSSELL and SONS, Wednesbury, STAFFORDSHIRE."

CROSLEY & CO.,

GAS-METER MANUFACTURERS,

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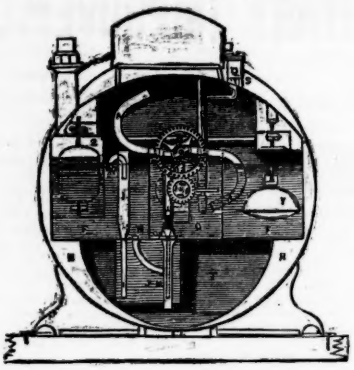

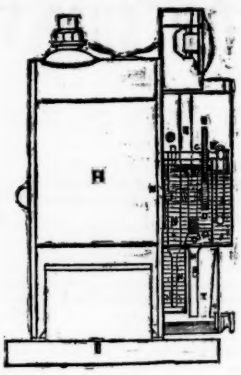

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C. and Co. continue to manufacture ordinary WET METERS of the very best description, Mr. W. Crosley having been for many years the principal and confidential assistant of his relative, the late Mr. Samuel Crosley, of Cottage Lane, City Road, up to the time of his decease, in which capacity he communicated to W. C. the secret of the mixture of the metals which has rendered the Crosley Meter so durable and superior to all others, as is evidenced by a large number of them being still at work, after having stood the test of nearly a quarter of a century's use.

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J. MEACOCK'S PATENT DRY METER.

OLD VALVE OF THE ORDINARY DRY GAS-METER.

In the accompanying Diagrams of Meters will be seen J. MEACOCK'S patent method of securing the Leather Diaphragm of his IMPROVED PATENT DRY METER. Instead of using the soldering iron for the purpose, by which the Leather is more or less injured, it is held between two flat Metal Rings, and screwed up sound on to a frame to receive it, the outward rim of which and screw-heads are shown in the drawing.

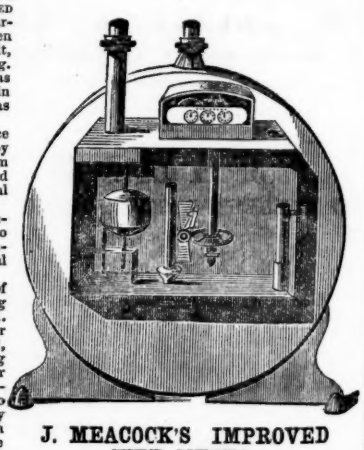
The Valve adopted in the above Patent Meter is also shown, as well as the ordinary Slide-Valve; the advantages of the former in not rising from its facing will be very apparent to the practical Gas Engineer, to whom it is of vital import.

J. MEACOCK begs leave most respectfully to submit to the notice of Gas Companies his PATENT DRY GAS-METER, trusting thereby to receive the same encouragement that has been so kindly awarded him in respect of his Improved Water-Meter, which has been patronized by all the Metropolitan Companies, as well as most of the Provincial Gas-works.

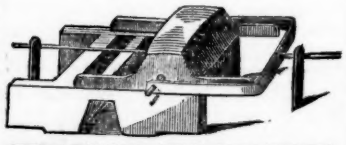
The public having been induced to desire Dry Gas-Meters in preference to Wet, and many Gas Companies being willing to yield to their wishes, J. M. has been induced to apply himself to the production of a Dry Meter, for which he has obtained Her Majesty's Royal Letters Patent.

Very frequently in fitting up the ordinary Dry Meter, the leather of the diaphragm is destroyed during the process of soldering, by coming in contact with the hot soldering iron. In his present process, J. M. has done away with its use, no solder being necessary, the leather being secured by two flat metal rings, between which it is screwed, riveted, or overlaid; the perishing effect of hot tools to leather being avoided, its durability must be longer; also, by this means, its repair when needful is most simple, as a new leather diaphragm can be applied by merely unscrewing the old one from the rim or frame to which it had previously been screwed up sound. In the ordinary Dry Meter frequent variations of registry have been detectable from defective valves, which tilt or rise from their facings: the slide-valve of this Patent Dry Meter will not allow any carbonaceous matter common to coal gas to tilt or lift the slide from its facings, and hence no variation. The heavy wear and tear to which the Meters of Gas Companies are subject, have at all times made it desirable to have them of the best materials and workmanship. J. M. begs leave to assure those who may honour him with their commands, that nothing but the stoutest materials for cases, the hardest gas-resisting metals, and best foreign leather for the interiors, will be used, and none but first-class workmen employed in their construction (the properties which his Improved Water-Meter is well known to possess, and which has obtained him that extensive patronage), will be strictly carried out in his PATENT DRY METER.

In respect of any orders with which he may be honoured, he is willing to give a guarantee to keep the same in repair, *free of all charge*, for three years, and allow the customary discount off the original list price.



J. MEACOCK'S IMPROVED WET METER.



NEW VALVE OF J. MEACOCK'S PATENT DRY METER.

Wet Gas-Meters Repaired and Reconstructed with J. Meacock's Modern Improvements.

METERS SENT ON APPROVAL.

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NOTICES.

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All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to Mr. W. B. King, the Publisher, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, SEPTEMBER 1, 1857.

NOTES UPON PASSING EVENTS.

THE session which has just closed has, so far as sanitary measures are concerned, been characterized by a repetition of the attempts of the partisans of "functioneering" to extend their favourite system, and, we are happy to say, by an equally determined resistance on the part of all who are able to appreciate the inevitable consequences of the destruction of our national independence that system would necessarily involve. The most important sanitary measures introduced by the present Government have, indeed, been signally defeated; and the General Board of Health Continuance Bills, originally presented, have, for the third or fourth time, been withdrawn after the expression of the bitter contempt of the majority of our independent legislators for that most useless institution; whilst even the Crowded Dwellings Bill has met with the same fate, in spite of the support given to the police authorities by an influential section of the Conservative party. A bill was indeed passed applying to Scotland the provisions of the absurd English Smoke Consuming Acts; but with this exception, the Government has been uniformly unsuccessful in its attempts to absorb into its own hands the fatherly duties of protecting and controling local authorites. So far, therefore, we have reason to be satisfied with the results of the session. We are at least in no worse a position than we were before; but the existence of the General Board of Health in any form, under its present rulers, is a standing menace of so serious a character to all the industrial interests of the country, that nothing can be considered to have been gained until that body has ceased to exist. It is one of the forms of expression, and a very active organ, of a principle of government which has been hitherto so invariably productive of fatal consequences to every society in which it has been applied, that we are convinced that no change in the details of its organization can ever counteract the fatal tendencies of the system it represents. Most earnestly, then, do we hope that, in the course of next year, the whole of this question may be thoroughly and carefully examined; but after the experience furnished by the select committee upon the Nuisances Removal Act, 1855, it is essential that the advocates of our local independence should take care to make themselves distinctly heard by the Legislature, or we may witness a repetition of the disgraceful farce of an inquiry into the operation of the Public Health Act, before a committee presided by the very chief of the institution appointed to carry that Act into effect. The friends or the foes of that measure are equally bound to secure a fair and full examination of its working and of its results; and we therefore urge all parties to prepare, during the recess, the materials necessary to enable the Legislature to arrive at correct conclusions upon the subject.

Unfortunately, the English nation has an antipathy to any discussions which assume the character of general theory; and the advocates of administrative centralization have very adroitly taken advantage of this national idiosyncracy, by introducing that system in cases in which it has been difficult at once to perceive the logical consequences ultimately involved, and in which, it must also be confessed, that there were plausible reasons for supposing that some central control over local authorities was required. The circumstances which led to the new police for London, the Poor Law Reform, and the Public Health Act were all of them illustrations of the deficiencies of the ancient local organization of the country.; but we may also add that they are illustrations of the danger of replacing local self-government by any administrations deriving their power from the Crown; and it is most important that the public should carefully weigh not only the actual, but also the probable results of the system with which those measures are connected. That these results will have a very practical bearing upon the class of interests with which this JOURNAL is particularly connected is, of course, our reason for dwelling upon them; and we have felt it our duty to continue the course of argument we have always maintained thereanent, even at the risk of incurring the reproach of being "theorists." It happens, moreover, that the character of the discussions which have taken place in Parliament and in the public press, with respect to the bill for preventing the overcrowding of dwellings, proves that so much dangerous misconception prevails, that so many very dangerous opinions are entertained (as we firmly believe) by some of the best and wisest men in the country, as to render it necessary, at present even, to dwell once more upon the dangers of the course into which we are being gradually driven. In the particular instance before us, we regret to find that the *Saturday Review*, by far the most able and most philosophical of all the London weekly papers, has assumed a very decided position in opposition to the rights of individuals; and it becomes, therefore, more important that the principles really involved should be again referred to.

In the first place, we would call attention to the curious illustration offered by the attempt to pass this "overcrowded dwellings" bill of the inevitable tendency of every administration to extend its influence and action. The Metropolitan Police have already succeeded in extending their attributions, beyond the mere repression or prevention of crime, to the control of private industry by means of the Smoke Nuisance, &c., Act and the Common Lodging House Act; and the attempt to secure powers for regulating the dwellings of the poor is but another step towards the intervention of the police in the details of private life. Unquestionably there are cases in which, in highly organized societies, it may be necessary to allow public authorities to interfere with the exercise of individual liberty, and in which the logical application of the law that every one should be entitled "so to use his own, as not to injure his neighbour" would justify the restraint of the power to do public mischief which every ill-conditioned, obstinate man would otherwise possess. But we contend that the less public authorities interfere in private affairs, the better it must be for the populations submitted to their rule; and that if any such interference be necessary, it should be exercised by local authorities, who are selected from the same class of persons as

those affected, and who are directly responsible for the discharge of their functions to a local constituency. The old lodging-houses were, alas! very fearful sources of misery, suffering, disease, and moral pollution, but we very much question the amount of good effected by the police towards remedying this awful state of affairs; for we strongly suspect that they have only displaced the evil without providing any remedy; and then the only testimony we have of the success of their intervention is that furnished by their own reports addressed to the Home Secretary, who cannot examine or verify their statements in any way. It sometimes happens to us to be obliged to cross the parks at a very early hour of the morning, and we have there far too often seen poor debased-looking wretches, reduced by misery, and, we fear, by vice, to the lowest grade of humanity, sleeping or crouching at the foot of the trees, within sight of the opulent mansions of Park Lane and Tyburnia. May it not be suspected that the sufferings of these poor creatures, driven to skulk about the streets until the parks are open to furnish them an uneasy repose, are even greater than those attendant upon over-crowded houses? Both are fearful social evils! we mean both the low, over-crowded tramp-house, and the houseless condition of the miserable wretches who haunt the more retired spots of our parks. But how are they to be most effectually remedied? We are convinced that it is not by imposing such charges upon the low lodging-house keeper as will compel him to increase the price he must charge for the paltry accommodation he offers; nor is it by the State's undertaking to protect the poor against the consequences of their own want of energy or their own imprudence. One effect of the recent regulations of lodging-houses has, we fear, been to increase the number of houseless wanderers (for, whatever the police may say, we know that they have increased); another has been to increase the number of the casual paupers who resort to the workhouse for the lodging—bad and repulsive as it was—which they formerly paid for out of their own funds. But, be this as it may, the great evil we perceive in the whole of the system of police intervention—of paternal government, as it is called—lies in the destruction of the self-reliance of the class it is designed to protect, and in establishing a principle which may be dangerously extended at some future period. With all the notorious defects of our social organization, and the short-comings of our municipal authorities, it is notorious that "the system works well;" and, indeed, so much better than any other system in the world, that the condition of our labouring population, as exemplified by the rates of mortality—a pretty sure test—is unquestionably more satisfactory than that of any other country. The evils which do still disgrace our land are, we firmly believe, most likely to be obviated by the removal of the interferences with trade and agriculture we still retain, and by the development of a sound system of education—not of instruction only, be it observed, Sir R. Peel's commercial reforms did more to improve the sanitary conditions of the people of England than any Public Health Act that ever was devised, because they enabled the poor to gain an easier and better livelihood than before. But one consequence of the impulse thus given to our manufacturing interest, simultaneously with the retention of much of our antiquated legislation upon landed property, has been to throw abruptly upon our towns the unemployed labour of the country, thus increasing the pressure upon the labour-market in the lowest grades. The very improvements which are taking place in our towns add to this peculiar phase of the sufferings of the poor, because their old haunts are disappearing one after another, and nothing is being done to supply them with new lodgings, within their reach that is to say; for we only see model lodgings in course of erection for model workmen.

With the writer of the *Saturday Review*, and with the authors of the Overcrowded Dwellings Bill, we then so far agree, as to admit that it is very desirable, in a moral and a sanitary point of view, to avoid overcrowding. But who is to be the judge of what constitutes "overcrowding?" and who is to be the judge when the police ought to interfere in these strictly domestic details? The old maxim, that "every Englishman's house should be his castle," is, after all, the safest one which can be adopted; and we strongly suspect that, notwithstanding the specious advantages attending the suppression of nuisances by means of the recent legislative enactments, every violation of this maxim has been, or will be, attended with great social evil. The Smoke Nuisance Abatement Act has, we fear, become practically an instrument by which the police extract bribes from manufacturers; the lodging-house inspection has also produced very similar results; for policemen are mortals, and it is not reasonable to suppose that they, who only receive some twenty shillings a week, should resist the temptation of a bribe, offered for the purpose of securing their kind oversight of infractions of laws which few have a direct interest in enforcing. Under any circumstances, the parties who ought to be entrusted with the enforcement of all this class of enactments are the local authorities elected by, and directly responsible to, the parties immediately affected by the sources of evil it is desired to remove. The central government is the very worst body to be entrusted with the powers necessary to effect the desired objects; and we distinctly assert that its intervention in such matters hitherto, in England, has only been productive of mischief and confusion.

We call the attention of our readers to a report, inserted in our "Legal Intelligence," upon the case tried before Mr. Yardley, at the Thames Police Court, which affords another curious illustration of the utter incompetence of the parties who are employed to prepare the Government measures of the present administration. From this case,—which, of course, the leading journals have not noticed, as it furnishes so strange a commentary upon the boasted Metropolis Management Act,—it would appear that the whole of the property of the low-lying districts of London may be left utterly without protection; or, at least, that the nature of this protection at present depends upon the interpretation a police magistrate may give to some disgracefully-worded clauses in that Act. Really, it would also appear, not only from this, but also from several other similar occurrences, that we require a tribunal of some kind, like the Supreme Court of the United States, which should exercise some kind of control and supervision over our Legislature, and should prevent it from committing some of the gross acts of negligence and of unconstitutionalism (to coin a word) of which it has lately been guilty. Amongst others, we may mention the extraordinary change made by the Appropriation Act of this session in the whole of the financial regulations of the country. Will it be believed that there was not found one member of the Lower House to protest against a clause slipped into this Act, by which the Treasury is enabled positively to use all the money voted in the course of the session in any way it thinks fit; provided only, that the objects upon which it is so employed have been included amongst those for which supplies are voted? Yet this is actually the case; and the clause of the old Appropriation Acts, which provided that "the aids and supplies provided as aforesaid shall not be issued or applied to any use, intent, or purpose whatever other than the uses, intents, and purposes before mentioned," has been replaced by a new one; to the effect, "the sums granted shall, and may be issued and applied generally to any use, intent, or purpose mentioned in, or to defray any payment directed to be satisfied by this Act," &c. We commend this apparently unimportant revolution to the attention of such of our readers as interest themselves in the management of political affairs; and, for the present, we beg to thank the *Surrey Post* for its excellent remarks upon the subject. Perhaps our habitual readers may feel more directly interested by the correspondence which has taken place between Mr. Toulmin Smith and the Government upon the subject of the Lambeth nuisances, to be found in a subsequent part of this JOURNAL; and we therefore invite them to consider carefully the various inferences which may be drawn from it.

Mr. Cowper has thought fit, in his place in Parliament, to say that Mr. Ward's statements at Brussels had been misrepresented. All that we can say in reply to this singular assertion is, that if Mr. Ward had been misrepresented, the *Moniteur Belge*, and all the Belgian press, were the parties who were guilty of the offence. But we as distinctly deny this assertion of Mr. Cowper's as it is possible to do; and we maintain that the published accounts of the proceedings of the Brussels' congress were substantially correct. If they had not been so, it was Mr. Ward's and Mr. Cowper's, and all the other Board of Health authorities' duty to have set the Belgian papers right. They were, however, so far from doing anything of the kind, that in a fit of post-prandial loquacity, Mr. Ward repeated, in other words, the substance of the statement we felt it our duty to call attention to; nor until Mr. Cowper was challenged upon the subject in the House of Commons was any attempt made to explain the gross mis-statements uttered at Brussels. We congratulate the public at any rate upon this fact, that it is now proved that

the General Board of Health lends itself to the diffusion of very incorrect statements; and it has, therefore, a very bad grace in its whining complaints of misrepresentation. It is, moreover, very strange that Mr. Cowper, even in his defence of Mr. Ward, could not avoid a repetition of the habitual disregard of facts which characterizes the board he is supposed to represent; for neither at Croydon, Rugby, nor Leicester, *nor anywhere else*, has the mortality diminished 50 per cent., as Mr. Ward stated; nor did Mr. Ward mention either Edinburgh or Ayr when he spoke of "quadrupling the fertility of the fields;" but he distinctly said that that result had been attained by the application of his system of "circulation," under the guidance of the General Board of Health, which both he and Mr. Cowper knew did not apply to Scotland. It is very painful to be obliged thus to notice Mr. Cowper's conduct in this matter, but we feel it incumbent on us to maintain the correctness of all that we have said upon the matter, as we were the first to call attention to it. Singularly enough, whilst Mr. Cowper is repeating Mr. Ward's very questionable statements about quadrupling the fertility of the land, Messrs. Harstein and Moll, in Germany and France, tax them with exaggeration.

We observe that the "*Commission des Phares*" of France has decided upon the application of the electric light to the various lighthouses upon the coast; and there is in the last number of the *Nouvelles Annales de Construction* a rather curious notice by M. Edmond Becquerel upon the cost of electric light, which we propose to translate in our next number.

THE RECENT ACCIDENT AT THE CHARTERED GAS-WORKS, BRICK LANE, St. LUKE'S.

The accident to the gasholder at Brick Lane, which, after all, is suspected to have arisen from a different cause than the one at first suggested, does not actually appear to have produced such disastrous consequences as we were led to believe, or as might naturally have been expected from the peculiar nature of the materials concerned, or of those let loose by its effects. No loss of life, or of limb, occurred; and even the pecuniary damage seems to have been confined to the company itself; but the loss and inconvenience thus sustained by the latter must be considerable in itself; and so trifling a difference in its condition might have rendered this accident the source of misery and suffering to the densely-peopled neighbourhood in which it occurred, that we think it behoves the directors of all gas-works to adopt every precaution which would tend to protect them against even the chance of an accident of the kind at first supposed to have happened here. The recent legislation upon noxious trades, moreover, renders it important that gasholders should not be susceptible of becoming sources of danger; and, as the best modes of protecting them from the effects of lightning do not involve any outlay worthy of notice, there can be no reason for their not being at once applied; even if the original supposition as to the cause of the accident at Brick Lane were incorrect.

Of course every engineer will at once assent to this very self-evident proposition; and to such men it would be equally unnecessary to describe the nature and the action of lightning conductors. But self-evident truths are too often forgotten; and the best-established and the best-conducted works, may be, at times, exposed to danger from their neglect. Many managers of country gas-works are, moreover, we fear, but little versed in the branches of applied science, which do not directly bear upon their ordinary pursuits; and it is with the hope of enabling them to execute effectually the trifling works we consider to be indispensable for the protection of every gas factory from the class of accidents to which we have referred, that we have ventured to lay before our readers a condensed statement of the reports published by the commission of the *Académie des Sciences* of Paris upon this subject, in the years 1823 and 1854; for, in this case, as in too many others, we are compelled to resort to foreign authors for the soundest discussions upon scientific subjects.

It is important to observe that the very nature of the materials employed in the construction of gasholders and of most modern retort-houses is such as to render them more liable to accidents from the effects of atmospheric electricity than ordinary buildings would be, because the iron exercises a greater influence upon a storm cloud than a brick or wooden building is able to do; whilst the old-fashioned lofty telescope-gasholders are, from the mere fact of their height, more than usually exposed to this source of danger. It may, therefore, so happen that the protection afforded by a lightning conductor fastened to a chimney shaft, or to a retort-house, which would be sufficient to protect a holder of large diameter and small lift, would be insufficient to protect a lofty one. In the instructions issued by the French commission in 1823, the law was enunciated that a lightning conductor would only protect a stone or wood building to a distance bounded by a circle equal to twice its height; but in the case of the *Palais de l'Industrie* of Paris, the commission of 1854 endeavoured, as far as possible, to place the conductors at intervals equal to four times their clear height above the ridges of the iron roof; and, indeed, no less than forty conductors were placed above the main and the lateral galleries of that building. To use a French phrase, we suspect there was "a luxury of precautions" in this case; and from all the inquiries we have been able to make, we are induced to believe that the preservative action of a conductor may, even when surrounded by metallic constructions, be considered to extend over a radius equal to its own height above the ground, especially when its elevation is considerable in comparison with that of the other objects likely to attract the lightning. When the surrounding buildings are constructed of such materials as do not exercise any particular influence upon the electricity of the atmosphere, there seems to be no reason for abandoning the old law, viz.: that in order to ensure immunity from this source of danger, lightning conductors should be placed so as to protect an area comprised within a circle whose radius should be equal to twice their height. The mass of metal in a gasholder is, however, usually so great, that we are strongly disposed to recommend that, whatever number of conductors may be placed around it, a distinct conductor should be applied to it, and that the height of this conductor be made as nearly as possible equal to the heights of the others in its neighbourhood, in order to guard against the effects of return shocks, which are frequently the most dangerous. Local circumstances may affect the correctness of the law above quoted; and it is essential to bear in mind that the frequency of electrical storms increases upon the eastern and the southern shores of our islands, or that, in more general terms, such storms are more frequent towards the east of a continent in the same parallel of latitude, and towards the equator on the same parallel of longitude. The occurrence of a mountain chain in the neighbourhood, or even the mere fact of a building being surrounded by other lofty structures, will also modify the extent of the danger to which it is exposed; but it is evidently safer to omit the consideration of these accidental securities, and to adhere to the rule for spacing the lightning conductors laid down by the *Académie des Sciences* in 1823.

The lightning conductors originally suggested by Franklin were made of iron, and the engineers of the Continent still use that metal, in the form of solid rods, for the purpose, to a great extent; adopting the precaution, however, of pointing the conductors with platinum, or even of executing the upper portion of copper terminating with a platinum point. Of late years, in England, copper wire has been almost exclusively used for the purpose, and the extremity of the conductor standing up beyond the building is formed of a solid bar of the same metal bearing an eye into which the copper wire is passed, and fastened by copper wires, so as to secure a perfectly homogeneous conductor throughout the entire length. The modern English system is, for many reasons, preferable to the old one; because, firstly, the copper wire can be more easily bent round any projections than a solid bar can be; secondly, because copper is not only a better conductor of electricity than iron, but it is also far less exposed to rust, and the consequent danger of breakage; and, thirdly, because it must evidently be a matter of importance that the material of which the conductor is composed should be the same throughout its entire length. The ordinary diameter of the rods terminating the copper wire conductors is made about half an inch, when it is only allowed to project 5 feet above its points of support; but when, as frequently happens in buildings of importance, the latter height is made as much as 20 or 24 feet, the diameter is increased to $2\frac{1}{4}$ or $2\frac{3}{4}$ of an inch. The generality of the lightning conductors fixed in England are, we would observe, hardly high enough, and we think that it would be desirable to make the mininum projection above the building it is desired to protect from 6 to 10 feet, especially if it be covered by a broad, flat roof. It is more important, however, that they should be continuous, and without any interval in their length, than that they should project to any definite height; and another point of essential importance is

that the end of the conductor should be turned at right angles to the face of the wall, or carried horizontally in the ground, about 2 feet below the surface, to a distance of 14 or 18 feet, and there again made to descend vertically, about 10 or 15 feet, into a well of water, or into constantly damp ground; the end of the conductor should descend at least 2 feet below the surface of the water. The conductor and the point are usually fastened to the wall by means of copper staples.

Really, the whole of this affair of lightning conductors is so simple, and the expense (which does not usually exceed 1s. per foot lineal, without fixing) is so small, that we hold it to be a culpable neglect on the part of those entrusted with the construction of gas-works if they do not fix them to all their exposed buildings. An outlay of less than £10 would have prevented the late accident at Brick Lane, supposing it to have been caused by the electric fluid; and it rarely happens that any conductor can be made to cost even that sum. The rules to be observed in establishing these invaluable protections are simply—1st, that the conductor should project from 6 to 24 feet above the highest point of the building; 2nd, that it should be continuous and without interruption of any kind from the point to the water surface of the well; 3rd, that it should be executed in a metal possessing the power of conducting electricity—a power possessed by copper in a more remarkable degree than by any other of the low-priced metals.

The reader who may be desirous of studying in a more consecutive or philosophical style than is consonant with a newspaper article the laws of atmospheric electricity which are likely to affect a building, is referred to a notice by M. Arago, inserted in the "*Annuaire du Bureau des Longitudes*" for 1838, or to the very elegant "*Traité d'Electricité et de Magnetisme*," lately published (Paris, 1855) by Messrs. Becquerel; or to the various papers upon the particular subject of lightning conductors, by Sir W. Snow Harris. The reports of the commissions of the *Académie des Sciences*, to which such frequent reference has been made, should be consulted. De la Rive's great work upon electricity also contains much information upon the various theoretical questions connected with the subject of atmospheric electricity, though it does not enter into the same detailed examination of its influence which the other authors quoted have done.

COMMENCEMENT OF THE WAR OF EXTERMINATION BETWEEN THE CORK GAS COMPANIES.

The Cork Gas Consumers' Company, like a regiment well known in our martial history, "dies hard." It might have been reasonably supposed that their utter rout before the committee of the House of Commons would have demolished them altogether, and that their remains would have been entombed in the "hole" providently dug at the commencement of their operations, anticipatory of such a catastrophe. But the concern still exhibits signs of vitality; and the organ of the promoters, the *Cork Examiner*, apparently unconscious that it is in merely a spasmodic state of existence, boasts of its healthy condition, and expresses a "conviction that there has not been in Ireland a more successful undertaking than this Cork Consumers' Company—will prove to be." Alack! for auld Ireland. We are told, on the same authority, that the "hole" has been enlarged into a "noble tank;" that the engine-houses and the offices are roofed in; that the retort-benches are constructing; that the pipe-laying is progressing; the gasholder nearly completed; and that, if labour can be obtained and paid for, all will be completed in four months; and that, by the 1st of January next, Cork "is to be lit by its own citizens."

The good people of Cork are, we believe, sufficiently acquainted with such representations, not to be deceived into the belief of the substantiality of a shadow; nor will the original holder of shares of the company feel disposed, by this drum-muster of flagging instalments, to hasten the faster to pay, whilst he finds that similar shares are offered to him at 50 per cent. discount; and, instead of answering readily to the third call, he will be inclined to join a funeral wail in consigning the whole scheme into the big "hole" provided for it by the directors. Engagements may have been made for an immense amount of contract work, and a large quantity of materials may have been ordered, and, so far, a life-like appearance has been given to the works; but the greater the present activity the greater will be the future retribution. The directors of the Cork Consumers' Company are dragging their shareholders deeper and deeper into the bog every day; and, if the latter do not make a vigorous struggle to extricate themselves whilst it is yet time, they may be dragged down too far for recovery. An opportunity presented itself in June last of escaping from their present difficulties, but it was neglected, and may not occur again. The United General Gas Company offered to relieve the directors and shareholders of all risk of future liabilities, but the offer was rejected after an apparent attempt at negotiation, and the Cork directors will hereafter have to answer to their shareholders for having refused to accept that opportunity of escaping from their dangers and difficulties.

It will be remembered that when tenders were sent in for lighting the city of Cork, the United General Gas Company offered to supply the public lamps with 15 sperm candle gas for £3. 10s. per annum, and to supply private consumers at 5s. per 1000 feet; and that the tender of the Gas Consumers' Company was £3. 15s. and 5s. 6d. It is evident, therefore, that 5s. 6d. per 1000 was the lowest price at which the new company estimated they could supply their customers with a prospect of moderate dividends to their shareholders. They did not profess to have any special mode of making gas more economically than the old company, and the consumers of their gas were expected to pay 6d. per 1000 feet extra for the satisfaction of knowing that the money would be paid to Cork shareholders. How long such a sacrifice was likely to be made—if made at all—we leave the shrewd shopkeepers of Cork to answer. It must be evident, however, that the new company would not obtain much custom unless they could offer to sell their gas at an equal price and of as good a quality as that of their rivals; and, after estimating the cost of production and distribution with a disposition to tender on the lowest remunerative terms, they fixed on 5s. 6d. per 1000. They had the advantage in making these calculations of the services of a Scotch engineer who had been educated in the cheap gas school, and yet the best offer they could make to the gas consumers of Cork was a price 6d. per 1000 feet higher than that of the old company whom they endeavoured to supplant. We may presume, therefore, that as the strongest inducement existed to make the lowest possible tender, the charge of 5s. 6d. per 1000 feet was deemed the lowest that could be made. To have entered into real competition with the old company by charging 5s. per 1000 must have been considered to have been a loss, and yet to the the standard of the rival company they must come to enable them to retain their customers. Such were the woeful prospects of the Cork Consumers' Company even in their best days, and an additional gloom has just been thrown upon them, as we observe, by advertisements in the Cork papers, that the United General Gas Company have reduced their price to private consumers to 4s. 6d. per 1000 feet! and offer very liberal discounts to those who consume above 40,000 feet per annum; the reduction to commence from the 1st of October next. To that price also must the Consumers' Company descend, if they hope to induce those who have hitherto been well supplied by the old company to leave them to try the new lights.

The *Cork Examiner* professes to rejoice at the coming struggle, as it will prove to the world that Irishmen are not the weak-minded, frivolous creatures that English writers represent. The editor of the *Cork Examiner*, however, must form a much lower estimate of the common sense of his countrymen than any English writer does, to suppose that they will be duped into joining or adhering to an undertaking which, by the admission of its promoters, must be a losing concern. Even allowing them the smallest grain of common sense, they cannot fail to perceive that if only bare remuneration could be obtained from the Consumers' Company's gas at 5s. 6d. per 1000 feet, there may be a large entry on the losing side of the ledger to balance the company's books when the price is reduced to 4s. 6d., to which it must descend to enter into opposition to the United General Company. When no dividends are forthcoming, and when expenses are incurred which there are no funds to meet, the shareholder will find but small comfort in the reflection that his money has been squandered to gratify the ambition, the spleen, and the party prejudice of a knot of agitators; whilst the real gas consumers of Cork will probably have to experience the usual result of such struggles in an enhanced price, to compensate for previous losses.

The directors and shareholders may, perhaps, think there is great virtue in "limited liability." Limited liability is, no doubt, an agreeable thing *per se*, but shareholders should bear in mind that it is accompanied by complete *irresponsibility* on the part

of those who manage their affairs, which is by no means equally pleasant; whilst directors themselves cannot fail to be impressed by recent occurrences in London, that limited responsibility can only be claimed by the fulfilment of certain conditions over which they may not have control. The Surrey Gardens Company (Limited) should serve as a warning for all time to come against entering recklessly into such speculations. It once really seemed a most successful undertaking. The magnificent building erected in the gardens was daily crowded to overflowing; large dividends were declared; and its shareholders were congratulating themselves on the flourishing condition of their enterprize, when one fine morning it proved to be "the baseless fabric of vision," leaving behind it, however, a "wreck" in the shape of a debt of £26,000, for half of which the whole property was mortgaged, the £34,000 of subscribed capital having entirely disappeared. What has become of the money seems to be as mysterious as some of the marvellous disappearances effected by the wonder-working wand of the Wizard of the North; but the simple facts remain, that the shareholders and unsecured creditors have lost all their money, and the mortgagees have swept off everything. When such things happen to an undertaking in actual operation and apparently in the full tide of prosperity, prudent men will look long at their money before they launch it on a sea of speculation under the guidance of irresponsibility to shareholders, and will think it better to sacrifice what they may have already ventured than incur the risk of losing more. There is, to say the least, no more immunity from jobbery and dishonesty in Ireland than in England, and, when we see so noble-looking a barque as the Surrey Gardens Company (Limited) wrecked on such shoals, under the very eyes of Mr. Coppock, the member of Parliament manufacturer, we may well be excused for not venturing to insure the Cork Gas Consumers' Company, even though it be classed A 1 in the corporation books, and its captain, the editor of the *Cork Examiner* and M.P. for Dungarvan, assures us that there never was in Ireland a more successful undertaking than it—"will prove to be;" and it be true that the twenty sureties have really fulfilled their promises by each taking £250 in the venture, as bail to the corporation for the due fulfilment of the company's engagements.

ON THE METROPOLITAN DRAINAGE. ON THE REPORT OF SIR B. HALL'S REFEREES

"Criticism is easy, art is difficult," says the proverb; and the report of Messrs. Simpson, Blackwell, and Galton may be fairly cited as an illustration of its truth. They were instructed by Sir B. Hall to find fault with the scheme of the Metropolitan Board of Works, and their attention was particularly called by that active Marplot to the weak point of Mr. Bazalgette's calculations, with respect to the total amount of sewerage to be provided for; so they exercised their ingenuity to discover faults, or to make them, if they did not really exist; and it must be confessed that they have to some extent succeeded in their endeavours, for many specious objections could be taken both to the point of outfall and to the details of the intercepting sewers proposed by the engineer of the Metropolitan Board. But when the referees entered upon the discussion of the third "head" under which they classified the questions referred to them, they quitted their vantage ground, and have fairly laid themselves open to attack upon all the leading points of the latter portion of their report. They then quitted, indeed, their safe position of critics in order to assume the more dangerous one of projectors or of advisers. We propose now to examine the scheme they have presented, and in the following remarks to adopt precisely the same classification which the referees have themselves adopted in the latter portion of their report.

No doubt, in the present very unsatisfactory state of engineering science, with respect to the application of sewerage manure, the "best mode of disposing of the sewerage of the metropolis is to place *it* (we suppose that the referees mean thereby to say 'to place the outfall') where *it* (we suppose that in this case they allude to the sewerage) will be rapidly and certainly mixed with large volumes of water, and be finally carried to sea." But thereupon at once arises the question of "where can this object be most satisfactorily effected?" and although the referees boldly assert that there are two points, one upon the northern, and the other upon the southern, shore of the river, where all the requisite conditions for a satisfactory outfall naturally exist, we must say that their assertion is at present totally unsupported by evidence, and we believe that it is in direct contradiction to the ordinary conditions of marine engineering. Of the persons whose evidence upon the regime of the Thames is alluded to in the report, the only men worthy of serious attention were Mr. Leach and Captain Bullock; because their opportunities of studying the river have extended over many years, and may be considered to have embraced a fair cycle of the periodic changes to which it is likely to be exposed. Yet the referees avow that they have paid more attention to their own useless float-tests, and that they appeal rather to Captain Burstal's report, than to the long-continued observations of the men who have devoted the whole of their lives to the study of the ever-varying conditions of the Thames. The fact is, that there is no river in the world in which the current of the ebb and flood tides of the estuary are so liable to change, as they are in the case under consideration; and we distinctly assert that, even if all that Sir B. Hall's referees urge in favour of the points of outfall they have selected were true upon the particular days when they made their observations, still the first long-continued storm, or the first heavy land-flood, might entirely modify the conditions of the currents at the points selected. It is, indeed, worse than a farce to pretend to judge of the conditions of the flow of such a stream as the Thames upon the result of six months', or even of six years' observations; and the very flippant style in which this important part of the discussion is dismissed by the referees, ought alone, we believe, to be sufficient to put the public on its guard against the conclusions so hastily arrived at and so weakly supported. The tides and currents of the river are, indeed, modified by so many circumstances connected with the outline of the coasts of England, with the velocities of the various tide-waves entering the estuary, and with the action of the wind, either in the Atlantic, the British Channel, or the German Ocean, that it is impossible to say, merely from a set of observations extending over a few months, or even over a few years, whether the laws attempted to be deduced from the float-tests were really the expression of their ordinary condition; whilst the incessant changes which take place in the dimensions and the positions of the banks at the Nore, ought to make every engineer cautious ere he attempts to reason elaborately upon the state of the estuary at any particular moment.

These remarks, it must be observed, apply with as much force to Mr. F. Forster's and Mr. Bazalgette's reasoning upon the float-tests as they do to the reasoning of the referees upon the same subject; and, we may add in passing, that it is singular to note the tendency of English engineers to jump to conclusions on subjects of such importance. But the most serious objection which we think can be raised to the point of outfall selected by the referees consists in this—viz., that, even upon the showing of the referees themselves, the point of outfall on the northern side of Sea Reach must be exposed to the serious objection of having a long period of slack water during flood tides; whilst the proposed southern outfall must be exposed to the same objection during the ebb tides. The very fact (assuming it to be *constantly* true) "that floats which entered Sea Reach with the ebb tides set in towards the northern shore, and were not carried up the river again with the following flood tide," is sufficient to prove that during the flood tide no current can exist towards the northern shore, other than that arising from the lateral motion of the edges of the advancing tide wave. Under such circumstances, we cannot admit that "the current would be sufficiently strong to prevent any deposit of materials" upon the northern shore during flood, any more than we can admit that deposits could not take place on the southern shore during ebb; on the contrary, we suspect strongly either that the observations upon which the referees based their report were valueless, or that it would be found, upon careful examination, that deposit is actually taking place at the points selected. We repeat, however, as we have always contended, that it is a matter of the most utter indifference where the point of outfall for the London sewerage may be placed, so long as the discharged stream is exposed to the action of the united southern and northern tide waves of our shore. Whether that point be placed at Erith, or at Sea Reach, the sewerage will find its way back to London; and it is therefore imperative upon our river doctors either to disinfect the sewerage, or at once to carry it to the British Channel, in a direct southerly direction. Wild as this last opinion might have sounded some years since, the enormons amount of the estimate for the unsatisfactory open sewers parallel to the Thames almost justifies its deliberate investigation, if it were only for the sake of com-

parison; and, really, the outlay now proposed is so "colossal," that it is more than questionable whether it would not be cheaper at once to tunnel through the whole distance to the Sussex shore. A railway tunnel, of 50 miles in length, executed in the formations likely to be traversed on this line, would certainly not cost more than £40 per yard forward, or a total sum of about 3½ millions. That some such effectual method of removing the sewerage at once and for ever from the Thames is necessary, must be evident to any one who would pass between Gravesend and Richmond; for, in the course of the voyage, it is impossible to avoid arriving at the conviction that the force of the flood tides is more than sufficient to drive up the sewerage waters into the upper reaches of the river, if they should be discharged anywhere within the influence of the combined southern and eastern currents of our shores. The estimate for the main *open channel* outfalls of Messrs. Simpson, Blackwell, and Galton is itself £3,145,300; and when it is born in mind that the suggested tunnel sewer across the country would be covered throughout its entire length, and that it would pass through an agricultural district, where—if anywhere—the foul waters might be applied with the greatest ease and most profit to the purposes of irrigation, we believe that few people would be disposed to hesitate before the trifling difference of outlay. We propose to work out this idea in a more definite manner on some future occasion; and thus to give Messrs. Simpson, Blackwell and Galton their "return inings." In the mean time we repeat that the total estimate for a tunnel sewer from London to the Sussex coast would only amount to £3,520,000, whilst the open channels from London to a point decidedly within the influence of the tides of the Thames, would be £3,145,300, and that the pumping power need scarcely be greater in one case than in the other.

Mr. Doulton, with the usual temerity of half-informed men, has thought proper to question the correctness of the calculations of Sir B. Hall's referees in the matter of the fall to be given to their discharge-channels. For our own parts, we are inclined to believe that, for the depth of water calculated upon, the fall is, if anything, rather in excess of that which would be required than otherwise; and we recommend Mr. Doulton to study such works as D'Aubuisson's "*Traité d'Hydraulique*," Nevill's "*Hydraulic Tables*," or Downing's "*Practical Hydraulics*," before he ventures to pass an opinion upon a subject of which he is nearly as ignorant as a superintending inspector of the Board of Health. The great objection, however, to the scheme of the referees consists in the fact of its contemplating the formation of two immense open sewers parallel to the river; for if the river itself, with all its mighty volume of tidal water, be so extremely objectionable, as it unquestionably is in our and in everybody's opinion, what must be the case with the more concentrated sewerage, flowing in a narrow channel through the more densely-peopled districts? The people of Erith, in their anxiety to escape the danger of an outfall in their neighbourhood, have thus fallen into the Charybdis of a pestilential channel nearer to their dwellings; but they will not be the only parties likely to suffer, for it is now proposed to carry great filthy ditches through nearly the whole of the cultivated districts of the lower Thames. We are convinced that the local opposition to this scheme would compel its authors to cover the sewers from one end to the other; but what would then become of the estimate? Indeed we suspect, from the passages in the report connected with the supply of tidal water for the purpose of diluting the sewerage to the safety-point, that the referees themselves would hardly support cross-examination upon the correctness of their calculations; and we are disposed to believe that the formation of these very objectionable open channels would, under any circumstances, exceed the amount so stated; but, of course, it would be premature to express any decided opinion upon this subject until the whole of the plans and estimates are before the public. The same reason also prevents us, at present, from discussing the modifications proposed in the internal system of draining the metropolis; but, as the scheme proposed by Sir B. Hall's referees for this purpose is naturally connected with the mode of constructing, and the course to be followed by, the outfall sewers, it seems to us to be a matter of little importance to discuss such accessories, when the leading characteristics of the scheme are so utterly inadmissible.

It appears, then, that the practical result of Sir B. Hall's interference with the operations of the Metropolitan Board of Works has simply been to retard hitherto any action on their part in the important duty imposed on them by the Act of Parliament under which they are constituted. The scheme proposed by the referees selected by the autocratic deserter from the cause of local self-government is, in our opinion, quite as objectionable upon theoretical considerations as Mr. Bazalgette's, supposing that no use is ever to be made of the sewerage; but it is also liable to the very serious practical objection that its execution would cost nearly twice as much money as the latter, without securing any better result. Most earnestly, therefore, do we call upon the members of the Metropolitan Board of Works to examine again carefully the whole question, and to do, even at this late period, what experience proves that they ought at first to have done—viz., consult a number of the most eminent men in the engineering profession or in the general walks of science upon a subject of this magnitude. The board must not, however, expect that the stupid modern system of "competition" into which they seem disposed to fall will serve them in this matter, for no man whose opinion is worth having would be fool enough to give it for nothing, or to run the risk of wasting his time and his ingenuity for the benefit, perhaps, of a stranger. Moreover, it is but common honesty that the public should pay for the services of those whom its representatives think it their duty to consult. We suspect that the engineering profession has already enough of "competition" in the matter of London sewerage, and that a further appeal for gratuitous assistance would, in this case, be hardly likely to meet with much success. The question is far too serious for any such empirical nostrums; and it should at once be referred to men capable of forming a comprehensive and philosophical opinion upon all the complicated natural phenomena involved in its decision. A commission composed of such men as Messrs. Stephenson, Bidder, Hawksley, Tite, Whewell, Lubbock, and Airy ought to be invited to examine the subject. No men of inferior authority or reputation to those we have named would possess sufficient weight with the public to justify the Metropolitan Board of Works in undertaking a work of the truly colossal magnitude of the outfall channels of the London sewerage. In France, if a great national work is to be undertaken, the *Académie des Sciences* is consulted; why are we in England always compelled to content ourselves with the opinions of second-rate men, chosen either by local intrigues, or by ministerial favour? The Metropolitan Board might commence a new era in such matters, and we earnestly beg of them so to do, as there is not the slightest reason to hope that the present Governmental authorities will ever quit the error of their ways, or learn to select competent, independent advisers.

Circular to Gas Companies.

The important discussion on public lighting which took place in the Bristol Town Council on the 18th ult. affords a fair specimen of the views entertained on this question by the majority of the municipal authorities of this country, and is especially interesting from the lucid and unanswerable reply to the arguments of those who advocate the principles that the public should be supplied at a lower rate than the private consumer, given by the gentleman who fills the honourable offices of chairman of the Local Board of Health and deputy-chairman of the gas company. He, however, omitted to urge one argument, which we deem important, viz., that the increased leakage from the numerous service-pipes supplying the public lamps more than counterbalance the economy produced by the exemption of that portion of the rental from bad debts and collectors' charges; but, in other respects, and more especially in the statistics he produced as to the prices charged in other towns, he completely demolished the arguments of his opponents, in a manner which ought to satisfy the most scrupulous stickler for public rights. These statistics have such an important bearing on this question throughout the country, that we reproduce them, in a tabular form, for more convenient reference:—

	Price per Lamp.	Price per Lamp, corrected by the Bristol Consumption and Scale of Lighting.	Price per 1000 feet to Private Consumers.
Bath	£3 0 0	£3 15 0	4s. 6d.
Bristol	—	4 4 0	4 0
Cirencester	3 10 0	4 11 3	7 0
Cowes	2 15 0	7 6 0	7 6
Exeter	3 7 6	4 11 3	6 0
Gloucester	3 8 0	3 11 6	5 0

	Price per Lamp.	Price Corrected.	Private Consrs.
Oxford	2 17 0	4 14 3	5 0
Ryde	3 10 0	3 11 6	8 4
Southampton	4 8 0	5 6 6	5 6
Weymouth	2 10 0	3 0 10	5 6
Yeovil	2 7 6	6 9 3	7 6

The scheme for the proposed purchase of the Glasgow Gas-Works by the corporation was rejected in the Town Council, on the 20th ult., by a majority of 26 votes against 10; and the local papers inform us that, at a meeting of the provisional committee of the proposed "Glasgow Consumers' Gas Company," held on the 26th ult., it was unanimously resolved to take no further steps in the organization of the new company. Our northern brethren have shown their habitual prudence and cautiousness in dealing with these questions.

A correspondent, in a usually well-informed weekly contemporary, has announced that the next dividend of the Imperial Gas Company is to be at the reduced rate of 7 per cent. per annum; and, as the statement has not been contradicted, we conclude it is authentic. A gradual fall of nearly £15 in the £50 shares of this company has taken place since the commencement of the Broadbent litigation; but we apprehend the present very adverse state of the coke-market has had more influence upon the reduction in the dividend than the expenses incurred in complying with the Lord Chancellor's mandate. £18,000 for the half year—the amount which the reduction represents—seems to be too large a sum to be absorbed by the litigation alone, costly and protracted as it has been. "What are we to do with our coke?" is, as we recently observed, a question which must soon set the inventive genius of gas engineers at work, with the view of so improving the quality as to render it fit for locomotive and metallurgic purposes.

The long-pending negotiations between the gas companies supplying the western districts of the metropolis have been, at last, brought to a satisfactory conclusion, and the works necessary for carrying the districting arrangements into effect have been commenced.

Communicated Articles.

A NEW SULPHIDE OF CARBON.

M. Baudrimont* has discovered a new sulphide of carbon, which stands in the same relation to carbonic oxide, CO, that bisulphide of carbon, CS^2, does to carbonic acid, CO^2. It may be formed by a variety of reactions, but the best method consists in passing the vapour of bisulphide of carbon over spongy platinum, or over pumice heated to redness. In this case CS^2 decomposes into sulphur, and into a gaseous body, which is the new subsulphide. This reaction shows its formation in the most precise manner.

It is also obtained in the process of making bisulphide of carbon,—by the action of hydrogen on bisulphide of carbon at a red heat; by calcining sulphide of antimony with excess of charcoal; by the action of oxide of carbon on sulphuretted hydrogen at a high temperature, CO+HS=HO+CS; and by the action of sulphurous acid, or of chloride of sulphur on olefiant gas at a red heat; it is also produced in the destructive distillation of sulpho-cyanogen.

The first method yields it pretty pure, in the others it is mixed with sulphuretted hydrogen and oxide of carbon. It is purified by being rapidly passed through solution of acetate of lead, of subchloride of copper dissolved in HCl, and, after being dried, it is preserved over mercury.

It is gaseous, colourless, with an odour resembling ordinary sulphide of carbon, but strongly ætherial, and not at all disagreeable. It burns with a blue flame, producing carbonic acid, sulphurous acid, and a little sulphur. It is rather heavier than carbonic acid. Water dissolves its bulk of the gas, but decomposes it into sulphuretted hydrogen and carbonic oxide. With alkalies it is rapidly decomposed. With lime-water it gives sulphide of calcium, and its own volume of carbonic acid,

$$CaO+CS=CaS+CO.$$

At a red heat it is slowly decomposed (1) by spongy platinum; (2) by the vapour of water into HS and CO; (3) by hydrogen into HS, and a carburetted hydrogen; (4) by copper into graphitoidal carbon, and sulphide of copper. Exposed to the sunlight with chlorine, a reaction takes place which gives rise to the formation of new bodies.

Exploded with oxygen in the eudiometer, it furnishes equal volumes of carbonic acid and sulphurous acid, from which, and from its decomposition with alkalies and with copper, its formula CS has been deduced.

* "Comptes Rendus," May 19, 1857.

Correspondence.

LAMING'S NEW PURIFYING PROCESS.

SIR,—I trust you will give me in your next number room for a few remarks on your circular of the 18th inst., in which you largely commented on my recent specification. It is evident you attach importance to its subject matter; and, as you express inability to ascertain its exact meaning, I feel myself called upon to aid your endeavour to exhibit fairly to your readers the nature of my invention; if between us success be attained, I shall be quite content to join with you also in leaving it to them to estimate its merits, until a practical essay, which is approaching, shall, to the extent of the means placed at my disposal, afford opportunity for superseding mere opinion by actual observation.

It was perhaps natural, but unfortunate, that you read my specification with a foregone conclusion of finding it the exponent of my advertisement. When I explain to you that the gas-purifying processes of the two documents are distinct things, you will cease to wonder at any "obscurity, complexity, and verbosity" you may have seemed to meet with. The specification was intended to secure several separate and isolated operations, and it will be for me to select and combine them so as to justify the announcement I have advertised.

I must beg also to correct another inadvertent error. I find in your circular the following passages:—"In the articles on the 'Chemistry of Gas Lighting,' which appeared some time since in this JOURNAL, it was observed that the difficulty of gas purification arose, not from the presence, but from the absence of ammonia. In accordance with this principle, attempts have been made to introduce free ammonia into gas, with a view to facilitate the removal of the carbonic and hydrosulphuric acids. These attempts, however, have been discarded on the score of expense. Mr. Laming, therefore, reverts," &c. From these expressions, your readers will doubtless infer that I am attempting what others before me have failed in doing, namely, giving effect to an idea originated by the author of the articles in question; the facts, however, are materially different. Unfortunately, he is absent, or he would have told you that, before he began in 1852 the "Chemistry of Gas Lighting," he was in possession of a French specification of mine, dated in 1848, in which I described the purification of gas from carbonic and hydrosulphuric acids by the agency of ammonia, and imputed the merit of the suggestion to the late Mr. Daniel Wilson, of the English Gas Company in Paris, with whom it had long been an unrealized project.

Having in these personal matters set the truth before you, and those who naturally look up to you for information, I will proceed to what more particularly interests them. I am glad to add to my own representation your testimony, and that of the author of the "Chemistry of Gas Lighting," to the effect that ammonia is energetic in purifying gas both from carbonic and hydrosulphuric acids, and also that the neglect of its use by gas companies is attributable to its expense, because I need not now any longer consider either of these facts as questionable; and, as it is self-evident that ammonia in solution is susceptible of being pumped through pipes from place to place, and of being brought into contact with the gas it has to purify in vessels hermetically sealed, nothing can remain wanting but a ready and cheap process for obtaining ammonia, and an apparatus for effectually recovering it from the gas, so that none of it be wasted. With such desiderata, gas purifying by the agency of ammonia would become at once the best commercial, as well as the most sanitary, process known; and in my specification will be seen how each of these advantages may be secured.

It is, of course, desirable for the ammonia to be produced on the spot where it is wanted; and any process to be used for producing it in gas-works must occupy but little room, be easy, rapid, little costly, and, above all, free from the possibility, even by accident, of emitting objectionable odour. I thus effectually combine the whole of these qualifications:—I place two tanks, covered or open, side by side in any convenient corner of the yard, and connect their bottoms with an exhauster. In each of the tanks, on a false bottom covered with tacking, I place sawdust, mixed with oxide of iron, until the tank be full; and then I run upon the porous material in one of the tanks as much ordinary gas liquor as it will hold. The proportion of oxide should be only so great as nearly, but not quite, to withdraw from the gas liquor the whole of its sulphuretted hydrogen—a proportion very easily ascertained by a few preliminary trials on a small scale; and the more easily, because no approach to exactitude is required—the only precaution which is useful being not to have an excess of oxide, as that would cause a small portion of it to be dissolved out. As the liquor enters the tank, it becomes instantaneously deodorized, and the oxide changed into sulphide of iron. By the time the tank is full, the liquor may be again run out by a pipe and cock so placed as to deliver it into a covered tank. When the liquor has somewhat drained from the material, I set the exhauster in action, to draw downwards through it a current of air, by which the sulphide of iron is speedily changed again into oxide, there being no danger of too rapid a revivification, because the drenched state of the materials keeps the temperature low. I prefer to force the spent air through a proper exit pipe from the exhauster into an open vessel of diluted acid, which arrests a small portion of accompanying free ammonia, and the residue which passes through, being devoid of

odour, may escape into the atmosphere. After being re-oxidized, the iron material may be treated with gas liquor as before, and again revivified; and thus the two parts of the process may be alternately repeated an indefinite number of times. I use two tanks filled with the oxide material, so as to have one of them always acting on the gas liquor while the other is under the action of the atmospheric air.

Gas liquor thus treated becomes a solution of ammonia, containing its original carbonic acid, but still very greedy both of that impurity and of sulphuretted hydrogen; it contains also a little cyanide, and sulpho-cyanide of ammonium; but none of its reagents have any action in dissolving out iron from its sulphide, and hence the process makes effectual provision for the perpetual reproduction of the oxide without any diminution in its quality, provided only that none be washed out of the sawdust, and which is prevented by the sacking on which it lies.

The use of oxide for disulphurating gas liquor for the purification of gas is more economical than its use for the purification of gas itself. Every engineer who has purified gas by oxide knows that the elevation in temperature, which always attends its revivification under such circumstances, gradually spoils it by casing its particles in fused sulphur, an evil from which the wet process is and must be exempt. And again, the wet process is so favourable to chemical action, that every particle of oxide acts on the sulphuretted hydrogen in the liquor, whereas only part of the oxide present in the purifiers acts on the sulphuretted hydrogen in the gas. In the last paper on the "Chemistry of Gas Lighting" the effective portion of the oxide exposed to the gas is estimated to be as little as its one-fourth part *.

The economy of purifying gas by ammonia is not limited to its sulphuretted hydrogen, but extends to the removal of carbonic acid also. The employment of lime for removing it is much more expensive, even if we put out of consideration the labour and inconvenience of manipulating with a second set of purifying vessels. Every gas manager may learn from his consulting chemist that on the reasonable assumption that an equivalent of oxide of iron in the tanks sets free from sulphuretted hydrogen in the gas liquor an equivalent of ammonia between each of, say fifty revivifications, then 40 lbs. of the oxide will liberate as much ammonia as most readily combines with 1650 lbs of carbonic acid, whereas it would take more than a ton of commercial lime to combine with a similar quantity of the same acid; so that we save about two yards of lime by expending one fifty-sixth part of its weight of oxide. And if we estimate the price of lime at 9s. per yard, then that of oxide would need to be £50 per ton before the cost of its use would be equally dear. There is another way of looking at the question of cost still more simple to the unchemical engineer. As oxide, by reason of its revivifications, can economically supplant lime in the purification of gas when used in a direct manner unfavourable to its action, and progressively destructive of its efficiency, then it must follow that it can economically supplant lime for receiving the impurities got out of gas when used in another way which is more favourable to its action, and less destructive of its properties.

The only other part of my specification to which I need here allude is the scrubber which I have designed for preventing waste of ammonia; it is a great improvement on my former diaphragm-scrubber, inasmuch as it is perfectly under command, and must be always steady in its action under every possible variation in the make of gas. By its means the gas is most effectually washed, and every trace of the ammoniacal salts removed from it, by the agency of a few gallons of water per ton of coals carbonized; so that the ammoniacal solution which may have been used for purification is, when mixed with the washings, recovered for the market, not only unreduced in strength, but more than doubled in value by the whole of the ammonia it and the water will have dissolved out from the gas. By again running the mixed liquors, when no longer wanted for the purpose of purifying, through the oxide tanks to deodorize them, they become susceptible of distillation to make sulphate of ammonia without the slightest nuisance, even in gas-works located in the most populous and exacting neighbourhoods; and I have designed apparatus for that purpose, which is already copied from my working by the chief sulphate-makers both of England and France. RICHARD LAMING, M.R.C.S.

Hayward's Heath, Sussex, Aug. 26, 1857.

[We may congratulate ourselves on having, by our remarks upon Mr. Laming's recent patent, elicited an explanation which at least renders the specification somewhat more intelligible, and from which it appears that our guess at the proposed mode of operating was perfectly correct. We stated that his final plan appeared to consist in preparing free ammonia from gas liquor, and washing the crude gas, first with ammonia and then with water. On all other points of the specification we gave a strong indication of our opinion, but on this particular point we confined ourselves to a simple description.—ED. J. G. L.]

* That every particle of the oxide of iron acts on the sulphuretted hydrogen present in gas liquor may be thus easily proved: Gas liquor contains sulpho-cyanide of ammonium, and that salt readily dissolves hydrated peroxide, but not sulphide, of iron. Stir into gas liquor some of the peroxide, in quantity considerably beyond the point necessary for precipitating the whole of its sulphuretted hydrogen; part of the oxide which is in excess will throw down cyanogen, and part will enter into combination with the sulpho-cyanogen and dissolve. This dissolved portion of oxide may be passed through a filter, and recovered as precipitated sulphide, by adding to the filtrate a little gas liquor. Take another portion of gas liquor, and throw into it, with diligent stirring, successive small quantities of the peroxide of iron, stopping short just when all the sulphuretted hydrogen is thrown down; every particle of the oxide will have acted on the last-named impurity, and become insoluble sulphide, for, after passing the solution of sulpho-cyanogen through a filter, it will afford no precipitate on the addition of gas liquor.

THE LAMBETH DISTRICT BOARD OF WORKS AND THE FIRST COMMISSIONER OF WORKS.

SIR,—In the last number of your valuable JOURNAL, some remark was made upon the language used by Sir B. Hall, on the 13th inst., with respect to the Lambeth Board of Works. The subject is one of so much importance, beyond the incidental occasion of your remarks, that I may perhaps be allowed to ask your more particular attention to it. It has become necessary for me to take, personally, rather an active course in the matter, on account of the share I had in the Nuisances' Removal Act, 1855; and, more particularly, on account of what I brought before the select committee of the House of Commons in 1855, as to the rejected clause, which Sir B. Hall now threatens to enforce, by a special Act, in the next session of Parliament.

The threats and the whole language of Sir B. Hall, in reference to this case, are singularly inappropriate. Nothing can give them fitness. Sir B. Hall, at the time he uttered those threats, was necessarily aware that the legal adviser of his own department had distinctly advised him that an entirely different course was the proper one. Yet Sir B. Hall seeks, in the House of Commons, to point the public indignation against the local authorities of Lambeth, and makes no allusion whatever to the advice he had already received to the contrary from his own legal referee! It is difficult to conceive anything more unfair or unjust.

On the 11th of August, the House of Commons ordered the printing of a "correspondence" between the First Commissioner of Works and Mr. Goldsworthy Gurney and other persons, including Mr. Gardiner, the solicitor, of 5, Whitehall Place, and the Home Office, in regard to the very nuisances in question. In the course of that correspondence, Mr. Gardiner informs Sir B. Hall, on the 24th of July last, that "the usual and most constitutional remedy for a public nuisance is by indictment;" and that "the proper course of dealing with this complaint will be for *you* [Sir B. Hall] to refer it to the Secretary of State for the Home Department, who will thereupon direct the Commissioners of Police to cause their constables or other officers to investigate and inquire into the matter on the spot, and to procure the evidence necessary to form the basis of any legal proceedings." Not a word is said about any obligation on the local authority. And this omission becomes the more remarkable, from the fact that a previous letter from Mr. Gardiner, dated the 20th of July, shows that he had consulted and considered the Nuisances' Removal Act, 1855, as one of the possible alternative means of resort in this case.

Yet, after such a correspondence with his own solicitor, Sir B. Hall ventures publicly to taunt and threaten the local authority of Lambeth as he did on the 13th inst.! Public decency requires that such conduct should not be passed over without exposure. It is inconsistent alike with common fairness and with a respect for the laws of the land. Even supposing (which is Sir B. Hall's only possible excuse) that he has, knowingly, made such a bad choice of his own officers that he cannot place reliance on their advice, and that he therefore treated the advice given by Mr. Gardiner with the contempt he has done, this gives him but the less justification for impugning the conduct of the authorities of Lambeth.

The Home Office seems to be, in fact, less well advised on matters of law than Sir B. Hall is, though it puts more faith in its advisers. In a letter of the 29th of July, Sir G. Grey says that the local authority under the Metropolis Local Management Act, putting in force the Nuisances' Removal Act, 1855, is the proper quarter to apply to in the case before us. Without stopping to inquire whether this statement was right or wrong,—and it is clearly wrong,—and without stopping to look at the Act itself, Sir B. Hall calls upon the Lambeth vestry to do what they have no legal power to do; and then, because they have a greater regard for the law than he has, threatens them as he did on the 13th inst.!

It is not necessary to go now into the merits of the clause to which Sir B. Hall alluded on the 13th inst. When he introduces it next session, as he threatens, I, for one, shall be prepared to oppose it, as I did in 1855. But it is of very great importance that the public should understand how law and departmental action are being abused and perverted, under cover of pretences for the public health! I cannot, perhaps, better show the bearing of this case than by subjoining a copy of a letter which I addressed to the Home Secretary upon this subject, in which the actual responsibility is pointed out.

LETTER TO SIR GEORGE GREY.

Lambeth Nuisances opposite the Palace of Westminster.

Highgate, August 21, 1857.

Sir,—Having read the "correspondence" just published by order of the House of Commons on the above subject, together with the extraordinary observations of Sir B. Hall on the 13th inst. (in which no reference to that "correspondence" is made), it is my duty, as having taken a conspicuous part in the discussion upon, and form of, the Nuisances' Removal Act, 1855, to submit to you the following observations thereupon.

In a letter, dated July 29 last, on page 9 of this "correspondence," Mr. Waddington says, by your instruction, that "the prosecution of these nuisances is left to the local authorities, who are provided with ample powers for that purpose."

I beg to state that you have been wrongly advised. Neither is "the prosecution left to the local authorities," nor are the latter "provided with ample powers for that purpose."

As to the *first*, while the force of certain other Acts is expressly reserved, the powers of the common law are also expressly saved unimpaired—a most important provision of the Act, introduced on my own representation.

As to the *second*, the local authorities are only hampered instead of helped in respect to such nuisances as these. I beg to refer to sections 44 and 27 of the Nuisances' Removal Act, 1855. The mischief of the former has already been proved in cases prosecuted by the parish of Lambeth. The latter completely ties the hands of the local authority from acting in the case now in question, except under special circumstances, and in a manner which makes proceedings futile. I beg to refer to my remarks on these two sections, in pages 66, 67 (*second edition*) of my work on the "Practical Proceedings" under this Act.

As to the compulsion most inconsistently threatened by Sir B. Hall upon the parish, I have to say that I submitted to Lord Palmerston, personally (while he was Home Secretary), several sections which would have been thoroughly effectual in securing action in all cases. Lord Palmerston approved these. The section to which Sir B. Hall alluded on the 13th inst. was one drawn by me, and approved by Lord Palmerston, but *wholly perverted and spoiled*, when introduced into the bill of 1855, by a clause added at the end. I showed this in my evidence before the committee in 1855. (See printed "Evidence," &c., pages 53—56.) In consequence, the clause thus spoiled was very properly rejected.

I am glad to take this opportunity of acknowledging again the care and courtesy of Lord Palmerston in going over with me, personally, many suggestions and clauses drawn by me, the embodiment of which into the Act as it stands has alone made it practically available. I retain the MS. of the clauses submitted to him, in proof of the above and other points that may arise.

In the case of the Lambeth nuisances now in question, it is quite clear that the only real course is the common law remedy of *indictment*. It is, further, quite clear that, inasmuch as the nuisance is felt, not in Lambeth but in the palace of Westminster, the duty of prosecuting the indictment in this case falls on the department having the care of Public Works. The responsibility of neglect rests on the head of that department only; none whatever can be fixed on the parish of Lambeth.

For the sake of public justice, therefore, as well as of the public health, I would urge that the terms of your letter of July 29 (above quoted) be withdrawn, and that the above course be recommended by you. Trusting that this will be done, I beg to offer any further explanation personally, being able here to put the matter very briefly only. Should the matter remain in its present state, it will be my obvious duty (after the part taken by me in the Act of 1855) to bring the whole state of the case, and the extraordinary misconception of the law published with your sanction, under public notice. The matter is one which must affect very importantly the confidence of the public in the due administration of the law and the conduct of public departments. I have, &c. TOULMIN SMITH.

The Right. Hon. Sir G. Grey, Bart., M.P., Home Office.

I also wrote to Sir B. Hall himself to the same effect; more fully pointing out to him that "section 27 of the Act of 1855 itself shows that the Lambeth local authorities *could not act at all*, in such a case, except under certain circumstances—which have not happened. They have no *power*, even, to act on any requisition made by you." I added, as to his threat to re-introduce the rejected clause, that this section "would have prevented the possibility of even having, in any place, a respectable local authority to act. No honest or intelligent legislature can ever listen to such a monstrous proposition as the section, thus perverted, embodies."

Hoping that public attention may thus be called to this extraordinary exhibition of ignorance of the law and recklessness of administration in public departments, which are particularly bound to set an example of heedfulness of both, I close my remarks on this case for the present; only adding that, as to Lambeth itself, I neither know nor have ever had any communication, direct or indirect, with any one connected with the proceedings of its "local authority." TOULMIN SMITH.

Aug. 28, 1857.

Register of New Patents.

241.—DAVID YOOLOW STEWART, of Glasgow, N. B., ironfounder, for "*Improvements in moulding or manufacturing cast-iron pipes.*" Patent dated Jan. 27, 1857.

This invention relates essentially to the manufacture or moulding of cast-iron pipes of the "faucet" class, and consists of a mode of preparing the cores of such pipes—a mode of placing the cores in the moulds previous to casting—as well as of a mode of removing the same after the casting has been accomplished. The invention has reference, more or less, to an invention for which Mr. D. Y. Stewart obtained letters patent for England on or about the 4th day of January, 1849.

The skeletons, or unclosed core bars, are plain cylinders, which are coated with a layer of vegetable matter, which is swept up to form by a shaping or sweeping edge. These faucet pipes, or pipes with an enlarged end, are cast according to the routine of this invention, with their faucets, or enlarged ends, downwards, and the cores with their faucet ends also disposed downwards, are hoisted up vertically from below by a chain or tackle, passed through and down the interior of the vertically disposed mould, or otherwise. In this way the plain cylindrical end of the core is entered up into the mould until the faucet portion attains its proper position in the corresponding portion of the mould. After the casting is completed, the mould-box, with its newly cast pipe, and the core within it, are all removed in a mass, and placed horizontally, when a suitable hydrostatic press is employed for forcing out the core in the direction the reverse of that which it took on entering the mould. The result of this system of procedure is, that the manufacture of the pipes is very greatly facilitated, whilst very superior castings are produced by it. The invention also relates, under another head, to an improvement upon the arrangements and contrivances specified under a grant of letters patent for England, obtained by Mr. D. Y. Stewart, on or about July 14, 1846, for "*Improvements in moulding iron and brass.*" In those improvements the formation of moulds for casting pipes is effected by a vertical spindle, carrying at its lower end a screw-blade arrangement, which ascends within the mould-box as the moulding sand is shaped into form beneath. Instead of using counterweights, or other apparatus at the upper end of this moulding spindle, the present invention provides for the use of an adjustable frictional nut-apparatus in connection with the top of the spindle, for the purpose of securing increased efficiency in the moulding action. According to this new arrangement, the moulding screw spindle is cut with a screw thread, which is embraced by a pair of worm wheels, set on parallel spindles geared together. The contiguous edges of these worm wheels form the nut or fixed threads for the screw on the spindle, and their spindles being provided with a suitable frictional brake apparatus, the moulder can temper the rise of his screw-blade spindle to the greatest nicety, and he can thus modify the longitudinal traverse of the spindle either up or down in a most convenient and effective manner. For, when the two worm wheels are held fast, they form a completely acting nut, and, as they are slackened off, they yield to a greater or less extent, and thus become what may be called a differentially acting nut, as, for example, in the drilling machinery made by Mr. Jos. Whitworth.

The claim is for—

1. The general arrangement and construction of machinery or apparatus for making the moulds for casting pipes, as described.

2. The system or mode of making cross-bars with flanges, whereby cups and cakes are dispensed with in forming the socket ends of the cast-iron pipes, as described.

3. The system or mode of raising the core from below through the mould for the manufacture of metal pipes cast with their faucets downwards, as described.

4. The system or mode of regulating the raising or lowering of the spindle of the pattern and presser by means of a screw spindle actuated by a pair of worm wheels, and frictional brake apparatus in making moulds for the manufacture of metal pipes, as described.

452.—JOSEPH QUICK, Jun., and ALEXANDER FRASER, both of Summer Street, Southwark, for "*Improvements in apparatus for regulating the drawing off and the supply of water and other fluids.*" Patent dated Feb. 16, 1857.

This invention has for its object improvements in apparatus for regulating the drawing off and the supply of water and other fluids. For these purposes, a vessel of size suitable for containing the largest quantity of fluid which may be required to be drawn off or supplied at one time, is connected to the main or source of supply. This vessel has a valve at its upper part opening inwards, which is closed by the water or fluid rising in the vessel, and it is preferred to employ a spherical floating valve for the purpose. The vessel has an outlet which is connected with the inlet or supply-pipe, in order that the same plug may be used to admit the fluid into and out of the vessel. For this purpose, the plug has a passage through it, which can be made to communicate between the supply-pipe and the interior of the vessel at one time, and at another time between the interior of the vessel and the outlet-passage; but the plug is prevented being turned in such manner as to cause the passage in it to communicate between the inlet and the outlet-passage; by which arrangement the fluid can only be drawn off or supplied from the vessel, and not direct from the supply-pipe.

The claim is not for any of the parts separately, but for the combination of an inlet, a vessel, and an outlet, with valves and passages combined therewith, in such manner that the flow of fluid from the inlet cannot take place to the outlet, as herein explained.

457.—HENRY GREEN, of Liverpool, in the co. of Lancaster, whitesmith and ironmonger, for "*An improved stove to be heated by gas.*" Provisional protection only obtained. Dated Feb. 17, 1857.

This invention consists in constructing a gas stove of an outer case, which may be of any suitable shape, form, or design, according to the taste of the manufacturer. This outer casing may be made double, to contain water, or a slow-conducting or heat-resisting material. Within this casing a series of vertical tubes or pipes are ranged round its circumference: these extend from the bottom to the top of the casing, and are intended for the passage of air, which, entering below, becomes heated, ascends, and escapes at the top.

474.—ROBERT BEST, of Birmingham, manufacturer, for "*An improvement or improvements in illumination.*" Patent dated Feb. 18, 1857.

This invention consists simply of placing the ordinary fishtail burner so that the flat part of the flame shall be horizontal instead of vertical, and using a dome or shade of a suitable form, or, in the words of the inventor, an oblate spheroid, the axis of which is much shorter than the longest diameter of the figure.

521.—WILLIAM FOOTMAN, of 24, Rodney Street, Pentonville, London, for "*Utilizing the illuminating properties of gas by improvements in burners and shades or reflectors.*" Provisional protection only obtained. Dated Feb. 23, 1857.

1. Improving the batswing burner by cutting or forming the slit of a conical or slightly wedge form, or other form than a mere straight-sawn slit, and smoothing, grinding, or polishing the surface of the slit, so as to produce a more even or desirable form of flame, and more perfect combustion.

2. Adapting shades thereto made with the following improvements:—With a long narrow opening at the top thereof, in lieu of a larg round hole, as heretofore. Setting or fixing the shade in a proper position, with respect to the long narrow opening and the flame of the burner, by screwing the frame down to a shoulder formed on the elbow or straight pipe, so that the flame burns lengthwise under or in the narrow opening of the shade. Turning over a rim, or ear-piece, or lap of the frame, to keep the paper or other reflecting material in its position on the frame, and prevent its being thrust over and injured by the flame.

Such shades or reflectors being applicable to other burners or lamps having a flat flame, and may be made ornamental by scalloped edges, tinted or embossed, or gilt paper, &c.

528.—JOHN KIRKHAM, of Tonbridge Place, New Road, London, civil engineer, for "*Improvements in the construction of furnaces, ovens, or kilns for drying, baking, or burning pottery or earthenware, bricks, tiles, or other similar articles; and in the means of collecting and condensing, or carrying off the smoke, gases, or vapours evolved from such or other fur-*

naces or fireplaces, or that escape or arise from the retorts and other parts of the apparatus used in the manufacture of gas." Patent dated Feb. 23, 1857.

That part of the invention relating to the carrying off and condensing the gases or vapours evolved within retort-houses is carried out in the following manner:—

In the centre of the building or retort-house is built a capacious shaft, enclosing within it one of smaller diameter, which is carried up to about half the height of the outer one. The large shaft communicates with the upper part of the retort-house by means of openings, constructed for the purpose of carrying off the vapours. All the upper part of the building is made air-tight, the only way of admission for fresh air being from below. The smoke and heated air from the furnaces is conducted along the flues into the inner shaft, which, rising, rarifies the air above, and causes sufficient draught to draw off the vapours in the retort-house, which, consequently, rise to the top of the outer shaft, supposing it to be built of sufficient height, and is drawn forward or conducted through purifying or condensing chambers.

The claim is for in reference to the second part of the invention, viz.: the means of collecting and condensing, or carrying off the smoke, gases, or vapours arising from the retorts and other parts of the apparatus used in the manufacture of gas; the collecting the same, and causing them to pass through condensing chambers or vessels, so that certain portions of the gaseous products may be arrested, condensed, and extracted from the vapours before the latter are allowed to escape into the atmosphere; also the mode of, and apparatus for, collecting and carrying off the vapours, smoke, or gases evolved from the retorts, or other parts of buildings in which the manufacture of gas is carried on.

571.—Walter Macfarlane, of Glasgow, in the co. of Lanark, N.B., engineer, for "*Improvements in moulding or manufacturing cast-iron pipes.*" Patent dated Feb. 26, 1857.

This invention relates to the moulding or manufacturing of cast-iron pipes or hollow cylinders in such a manner that both the mould and its core are made or shaped simultaneously or at the same time by one and the same operating action, the moulding being of the class ordinarily known as "green sand." The moulding-box, for moulding pipes vertically, is a plain cylinder bolted by a bottom flange to a travelling carriage. An end plate is hinged to the under side of the cylinder; this plate being solid, so as to be capable of covering up the sand and pattern, a small conical hole only being formed in the centre of the plate to receive the lower end of the core-bar spindle. For socket-pipes, the cylinder has upon its upper end a moveable piece corresponding to the socket. The core-bar is of considerable length, the upper part being plain and of diameter to fit the collar of the moulding-pattern piece, whilst the lower part is of a diameter approximating to that of the intended core. This part of the core-bar, or the actual moulding portion, is open, its longitudinal flutings wedged shaped in transverse section, or otherwise formed, so as to present a suitable intended periphery. These flutings or longitudinal grooves are for holding mandrils of small diameter, which are inserted, one in each groove, for the purpose of leaving openings in the sand of the core for the escape of gases, and for other uses. The pattern-piece, the ontside of which shapes the interior surface of the mould, whilst the inside similarly forms the external surface of the core, is a plain short cylinder, suspended by long arms from a collar-piece, and attached to it is an arrangement of inclined vanes or screw-plates; or, instead of this contrivance, other arrangements may be adopted for working up the pattern-piece upon or through the sand. When a pipe is to be moulded in this way, the core-bar being placed in the cylinder-socket, or hole at the bottom of the moulding-cylinder, the pattern-piece is passed over it and set at the bottom of the cylinder. Sand is now put into the cylinder or moulding-box, whilst the pattern-piece and its appendages are made to revolve; the pattern-piece being gradually urged to the top of its transverse, thus shaping both the mould and its core at once. Provision is made for leaving openings in the sand of the actual mould by placing mandrils in the cylinder, just as in the case of the core. When the pipe has been cast, the holes left in the sand by the mandrils, which are withdrawn for the purpose, allow the steam and gases to flow off, whilst they also admit of the easy breaking up of the core-sand when the casting is to be taken out of the box. Advantage is also taken of the expansive effect of the gases and steam generated by the contact of the hot metal with the sand, to break out and disengage the core-bar by plugging up the openings at the upper ends of the mandril holes or cells, just at the time when the bottom plate is hinged down after the casting is performed. The rush of gaseous matter then disengages the parts in a very complete manner.

Instead of thus forming both the mould and its core at the same time, the two may be produced separately by the same means or a modification thereof. When the pipe is to have a socket or faucet-piece upon it, the faucet-pattern in two halves is put into the tube of the mould-box, after the cylindrical pattern-piece has been wholly withdrawn. Sand is then rammed between the exterior of the faucet-pattern and the corresponding interior of the faucet-socket on the top of the moulding-cylinder.

In making cores for pipes to be cast horizontally or out of the vertical, the core is moulded or shaped in a core-box consisting of two longitudinal halves hinged together—one half being provided with a small pin standing up in the centre. This pin is for receiving a short "peg-strap," or piece of metal of a concave form; this "peg-strap" having a small hole in it corresponding to the pin in the core-box, and on which pin the "peg-strap" is adjusted. Both halves of the core-mould-box are then filled in with sand, and the usual core-bar being placed in the opposite half of the box, the two halves are brought together, and the moulding of the core is completed. The moulded core is then lifted out and placed on a rack for use, the "peg-strap" being imbedded in the sand of the core and being removed with it. A short peg is then placed in the hole in the "peg-strap," and this peg, when the casting comes to be made upon the core, forms the upward stop for the resistance of the action of the fluid metal conveying the pressure over an area of the core equal to that covered by the "peg-strap." To guide the core to its exact position in the pipe-mould, when a casting is to be made, a small projecting piece is moulded upon an end of the core, and a point being formed upon the laying-down board, a corresponding recess is made in the pipe-mould itself. Hence, the insertion of the projection upon the core into the recess in the mould ensures accuracy in the relations of the parts. A pin or screw passed laterally through the upper half of the moulding-box, for the actual pipe-casting, forms the resisting-piece or stop for the "thickness-box," which stands upwards from the core placed in the box. The cellular or open system of sand-work is also applicable in this process.

This invention further refers to the forming of moulds for bent, elbow, or branch pipes and fittings with green sand-cores, without using nails or pegs of any kind. The bend or elbow pattern is made of the exact shape of the intended elbow pipe, and it is in two halves, each moulding-box having in it a separate and distinct pattern. The under half of each of the two elbows is placed upon a lay-down board, and the drag part of the box is rammed up with sand, and then turned over in the usual way. The inside or core part is then rammed partially with sand, and upon this is laid a species of duplex core-bar, one side for each elbow. The top halves of the boxes are then placed upon their corresponding under halves, filling up the inside or core with sand from the end. The top part of the box is then placed on and filled in with sand in the usual manner, parting the box, and taking out the top part of the pattern. The box is then turned over, and the under half of the pattern is taken out, and the mould is ready for casting.

The numerous illustrative figures attached to the specification indicate certain modifications under which the several improvements referred to may be advantageously carried out in practice.

The invention relates—

1. To an improved system or mode of moulding or manufacturing cast-iron pipes, or other similar articles, in a vertical position, or, as it is technically termed, "cast on end." In this improved system, or mode of moulding, the pattern answers the two purposes of forming the mode and the core; or the two purposes for forming or shaping both the insides and the outsides of pipes at one operation. The whole of the operations are effected by what is technically termed "green-sand moulding;" *i. e.*, the core and moulds do not require to be subjected to heat, or to any drying process prior to casting. In the mould or core made according to this invention, cellular cavities are made, which cavities serve the purpose of "venting" the core, and of receiving and holding the gaseous matters and steam, generated or set free by the action of the heat arising from the molten metal upon the sand or moulding material. These gaseous matters and steam, if confined within the cellular cavities formed in the mould and the core, attain a force sufficiently expansive to partially blow the sand out of the mould and core. By these means the casting is much more easily set free from the core and lifted out of the mould than by the ordinary practice; and it may be remarked that in this process, although heat is not intended to be used, it may be applied if found necessary.

This invention relates, secondly, to a system or mode of moulding or manufacturing cast-iron pipes, or other similar articles, in a horizontal position; in which system or mode the core is made in a separate core-box, or it may be formed by the interior portion of the pattern. The core has a cellular cavity extending throughout its length, and projecting from its exterior surface is an iron pin, which is caused to bear against a screw-pin or other suitable bearing in the tube part of the moulding-box; and the green-sand process of moulding is adopted, as before described.

The third part of the invention relates to an improved system or mode of moulding or manufacturing cast-iron pipes, or other similar articles, in a horizontal, or nearly horizontal position. In this system, the pattern is made in two equal parts, and it serves the two purposes of shaping the mould and forming the core. Cellular cavities are formed in the mould and core, or in the core only (if sufficient), for the purpose of venting the mould and retaining the aqueous and gaseous matters, as before named. The whole of the operation of moulding, by this system, is effected without the introduction of nails, chaplets, pegs, or other foreign substances into the casting.

The machinery for moulding and manufacturing cast-iron pipes in a vertical position, consists of a pair of massive vertical standards erected between two parallel walls, and bolted at the bottom to rectangular framing, forming the base of the machine. The moulding-box is of a polygonal form, with a funnel or hopper-shaped mouth, and it is bolted down to a strong rectangular table or frame. This table, which is moveable, is supported by means of two gudgeons or journals, which project on each side of the table, and rest upon the framing. A circular aperture is made in the table, in which aperture a moveable metal ring is fitted. This ring moves in a vertical direction, and is moved and held up in its place by the cams or eccentrics which are fixed to the shaft. The eccentrics are actuated by means of a lever on the shaft, so that, by turning the lever handle through a quarter of a revolution, the eccentrics move the ring downwards, which then falls away from the end of the moulding-box. There are two projections, having inclined surfaces upon the under side of the ring, with which the cams come in contact when the ring is raised. These projections serve to wedge the ring up more firmly against the bottom of the moulding-box. The core passes down through the ring, and is bolted to the lower part of the table or frame by a broad flange. It is in the annular space between the core-box and the moulding-box that the pattern-piece, which shapes the mould and forms the core, moves. The pattern-piece consists of a short hollow cylindrical piece of metal equal in thickness to the casting required, with vanes or blades attached to its internal and external surfaces. The pattern-piece is fixed to a central vertical shaft, which passes through a moveable cross-head or frame, and has upon its upper extremity a toothed wheel. The cross-head is carried up and down with the shaft, and serves to guide it in a vertical direction. It also carries a driving-pinion, and it moves up and down the guides formed on the side-standards. Rotatory motion is communicated to the toothed wheel through the pinion, which is put in motion by means of gearing connected with a suitable prime-mover. At the same time that the rotatory motion is given to the shaft, a steady, uniform, vertical motion is given to the cross-head and pattern-piece. The speed of the upward motion of the pattern-piece is regulated by the degree of compression to which the moulding material is to be subjected, or the pattern-piece may be raised by its pressure upon the sand, as it accumulates beneath the inclined screw-blades. In this modification of the improve-

ment, both the core-bar and the moulding-box are made with longitudinally-fluted surfaces, forming angular projections therein. The cellular cavities next the core-boxes are formed by the mandrils, which are metal rods attached by means of nuts to the collar-plate, which is carried by the shaft. The mandrils pass through eyes fitted in the core-bar, which serve to keep the mandrils steady and parallel to each other. The mandrils of the moulding-box are bolted to the web of the cross-head, and the series of mandrils are arranged, by preference, to fit the recesses formed by the flutings or grooves of the moulding-box, and are passed through eyes similar to those upon the core-bar. A segmental-shaped rack or quadrant is fitted to one side of the moulding-box, and upon a short shaft projecting within the framing is fitted a pinion in gear with the rack. A handle is fixed upon the square end of the shaft, and by this means the moulding-box and table are caused to move towards a horizontal position between the standards when required. On the upper part of the moulding-box are two catches, which fall into recesses made for the purpose upon the framing.

The patentee does not confine himself to the dispensing with heat in these processes, nor does he confine himself to the principle of uncoring the pipe or mould by steam or vapour. He may even use a colapsible core-bar, or any other means; and, further than this, he may form cellular cavities or open portions in the moulding material, to be used simply for the purpose of obtaining an easy means of breaking up the moulding materials after the casting has been made, independently of the use of elastic vapour.

Another modification of this system or mode of moulding consists in making the inside of the pattern answer the purpose of forming the core. By this means, the expense of making separate core-boxes is avoided, as well as the inconvenience arising from any inaccuracies in the core-box and pattern itself. In this modification of the invention, instead of using an ordinary screw for pressing down the "thickness-peg," a concave-shaped metal plug, or, as it is here termed, "a double-inclined binding-stud," is applied to this purpose, the top and bottom, or bearing parts, working on inclined planes.

The last part of the invention relates to a system or mode of moulding or manufacturing "bends," "elbows," "branch pipes," and fittings of a similar kind, as described.

The claim is for—

1. The simultaneous formation of the moulds and cores for casting pipes—on the surfaces for shaping or producing both the inside and the outside surfaces of pipes, the said moulds and cores being formed in a vertical position, for the purpose of casting the pipes "on end."

2. The general arrangement and construction of machinery, or apparatus, either stationary or moveable, for forming the moulds and the cores, ou both the inside and outside, shaping surfaces of the pipes, at one operation.

3. The system or mode of making the moulds and cores for cast-iron pipes, with cellular cavities, and longitudinal or other openings, for the purpose of venting the mould and core, and for facilitating the breaking up of the core or mould, and also for confining the steam and gaseous matters, which by their expansive force serve to partially break up the core and release the casting.

4. The system or mode of moulding or manufacturing cast-iron pipes in a horizontal position, in which the casting is partially uncored by means of the expansive force of steam or gaseous matters.

5. The system or mode of forming the moulds for casting pipes, in which the pattern of the pipe serves the twofold purpose of forming the moulds and the cores; the said moulds and the cores being formed in a horizontal position.

6. The use and application of thickness-pegs of one uniform thickness throughout, instead of nails or chaplets, to the cores of pipe-moulds, and of a bearing-plate or "core-strap" for holding a thickness-peg, by means of an adjusting-screw or double-inclined binding-stud in the moulding-box acting upon the thickness-peg, by which the core is kept in its proper position during the process of casting.

7. The system or mode of moulding and manufacturing "bends," "elbows," "branches," "heads," and other pipe fittings, in which the pattern is made to form the mould and the core.

8. The system or mode of moulding or manufacturing cast-iron pipes by the agency of moulds and cores which have not been subjected to the action of heat.

576.—William Wilkinson, of Nottingham, engineer, for "*Improvements in lighting and in lamps.*" Provisional protection only obtained. Dated Feb. 27, 1857.

This invention consists in constructing lamps with a reservoir for gas, so as to form portable gas-lamps, which, being charged with gas, give it out by pressure from springs or weights to the burner, affording light while any portion of the gas remains in the reservoir or body of the lamp. The inventor provides against leakage by means of a pipe leading from the reservoir into the burner-tube, and prevents escapes by packings of vulcanized rubber.

An outer casing to the reservoir may be constructed in China metal, or otherwise, and may be ornamented in any manner desired. The reservoir is charged under pressure.

These lamps will be found useful in railway and other carriages, waggons, vans, &c.

588.—Charles Weightman Harrison, of Woolwich, in the co. of Kent, civil engineer, for "*Improvements in obtaining light by electricity.*" Patent dated Feb. 28, 1857.

This invention relates, firstly, to the preparation of electrodes for producing light by means of hollow cylinders of carbon or barrel electrodes, which are formed by passing a current of coal gas through a chamber which is traversed by metal tubes joined with a furnace, the flame and heated air of which are drawn through the tubes. When these attain a red heat, they gradually become coated with a dense form of carbon. Pencil or solid carbon electrodes are formed by suspending small rods or pencils of wood charcoal upon a frame of iron, which is placed within a heated gas chamber or retort, where it is subjected to a high degree of heat. The tubes and pieces are allowed to remain exposed to the action of the gas until they are coated to the desired thickness, and they are then cut or ground down to any required form of electrode.

Another of the improvements consists in the use of electrodes of spongy or powdered metals, prepared by means of compression into any determined shape, and cut to the required form. The metallic powder is first slightly moistened, and, being placed in an iron mould of any suitable shape, hydraulic or other pressure is applied to a piston which accurately fits the aperture of the mould. In this manner the pulverulent matter is solidified and made suitable for use. In the employment of these electrodes, lights of various colours are produced according to the kind of metal or combination of metals used. The metallic dust may be mixed in various proportions with carbons or other substances, and a brilliant white light is obtained by using a positive electrode formed of a combination of zinc powder and plumbago, consisting of three parts of plumbago with one of zinc.

This invention relates, secondly, to an arrangement of electrodes, by which a continuous light is preserved. To effect this, a cylindrical electrode is employed, which is placed on an axis in the direction of its length. By suitable arrangements, a rotary as well as a horizontal or onward motion in the line of its axis is imparted to it. Another electrode is placed opposite (and, by preference, one is used that is in form of a point or pencil), the apex being in contact with the circumference of the cylindrical electrode, and near to one of its ends. If motion be then given to the cylindrical electrode, the opposite electrode will trace a spiral path over its surface from one end to the other, the contiguity of the convolutions being determined by the rate of its onward progression. In order to obtain the light, the opposite or pointed electrode is connected with the armature of an electro-magnet, or with a coil of conducting medium, in such a manner that, on the transmission of a current of electricity, this electrode is drawn or moved away to a suitable distance from the other, and then retains a fixed position until on breaking the electric circuit it again renews the contact. The circuit of the current is so formed as to render the rotary cylinder an electrode of positive electricity, and the point or pencil electrode of negative electricity, the light being by this arrangement produced on the circumference of the cylindrical electrode, and its motion continuously bringing fresh surfaces to the operation of the luminous portion of the current; a uniform amount of resistance is offered to its passage, and the light is generated with a steady constancy due to that of the current itself. To obtain the maximum amount of light, it is necessary to proportion the distance between the electrodes to the intensity of the electricity employed. The duration of the light will, of course, depend upon the size of the rotatory-barrel electrode; and as by its motion, which is derived from clock-work or other suitable means, it maintains a steady and permanent light, the patentee has, in contradistinction to other electric lights, called this arrangement the electric constant-light apparatus.

The third part of the invention relates to a mode of maintaining a uniform distance between a rotary disc positive electrode and a point or pencil negative electrode. This is effected by keeping in contact with the periphery of a rotary-disc electrode a roller, pulley, or other contrivance, which is connected with a chain or band, or by levers, with a pendant or sliding point or pencil electrode, whereby, as the positive electrode diminishes, the negative electrode is permitted continuously to advance, without causing a fluctuation in the light.

The fourth part of the invention refers to improvements in producing a succession of flashes or streams of light. It has already been proposed to obtain electric light by a rapid succession of flashes, resulting from the vibration produced by mechanical agency of electrodes; the patentee, therefore, does not claim this as new. He employs, however, for the purpose one or more electro-magnets, to give rise to or effect a reciprocative or vibratory motion in electrodes; and he prefers to use the metal mercury for the positive electrode in producing flashes or streams of light. He sometimes employs steel armatures in connexion with the electro-magnet, in place of soft iron, so that its residual magnetism shall serve to retain the electrode or electrodes in the position assumed during the passage of the last current.

Another mode by which he produces successive flashes or streams of light consists in the employment of a coil of conducting medium, and, by means of an axial bar or magnet used in connexion therewith, a vibratory motion is given, on the passage of the current, to one or more electrodes, which may be arranged as before described.

This part of the invention is very suitable for lighting marine buoys, the electricity being conveyed through insulated submarine conducting medium.

The sixth part of the invention relates to the introduction of an induction-coil, to be used in connexion with a primary current; in giving any required motion to electrodes by the operation of such primary current, and producing light by means of the induced current alone. This operation is effected by passing a primary current of voltaic or other electricity through one or more induction-coils, and at the same time moving or regulating electrodes or other apparatus in any desired way. To produce the light, the electrodes are connected with the secondary circuit of the coils, so that that current only shall pass through them and cause ignition. The primary current is not cut off or suspended, but its direction simply changed by means of an electrical reversing apparatus.

The seventh part of the invention consists in a peculiar mode of obtaining the electric light, by which signals are effected; and the last part indicates a mode of communicating to vessels at sea, by flashes of electric light, the depth of water in harbours or on banks. This is done by means of a float within a tube, which, by suitable mechanical contrivances, as it rises and falls, calls into operation different electro-tomes, giving rise to flashes of light regulated as desired.

The claim is for—

1. The mode of forming gas carbon electrodes, for obtaining electric light.

2. The use of electrodes composed of compressed spongy or powdered metals, or a combination of metal powder and plumbago.

3. The arrangement of electrodes so as to produce a constant electric light.

4. The method described for maintaining a uniform distance between a rotary-disc electrode and a point or pencil electrode.

5. The arrangement for producing a succession of flashes or streams of light, as well as for the use of two or more negative electrodes in combination with a single positive electrode of mercury.

6. The mode described by which any number of marine buoys or beacons may be successively illuminated.

7. The arrangement of means for producing electric light by the use of a secondary, or induced, current.

8. The combination of magneto-electric with secondary currents for the production of light.

9. The system described for effecting signals by electric light.

10. The arrangement for indicating the depth of water by the same means.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED PATENTS.

2090.—JOHN BEALE, of East Greenwich, Kent, engineer, for "*An improved construction of rotary engine, applicable for pumping and measuring fluids, or for the production of motive power.*" July 31, 1857.

2168.—FREDERICK LIPSCOMBE, of the Strand, London, for "*Improvements in the mode of diverting the London sewerage from the River Thames, and in discharging it into the sea.*" Aug. 14, 1857.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED PATENTS.

992.—JASPER WHEELER ROGERS, of Peat House, Robert's Town, in the co. of Kildare, engineer, for "*Improved means of, and apparatus for, collecting for use the excrement of towns and villages, and for facilitating the drainage of houses generally.*" April 8, 1857.

1027.—THOMAS WILTON, of Eastbourne, Sussex, gas engineer, and JOHN HUGGETT, of the same place, engineer and smith, for "*An apparatus for regulating the flow or supply of gas.*" April 11, 1857.

1060.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, London, civil engineer, for "*Improved means of lighting gas for illuminating and other purposes.*" April 14, 1857.

1114.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, London, civil engineer, for "*Certain improvements in meters for measuring the flow of gas, water, or other fluids.*" April 20, 1857.

1122.—EDWIN MARTEN, of Pratt's Row, Phipp's Bridge, Mitcham, Surrey, for "*Improvements in apparatus for regulating the pressure and supply of gas.*" April 21, 1857.

1187.—THOMAS DICKASON ROTCH, of Surbiton, Surrey, for "*Certain new and useful improvements in gas generators.*" April 27, 1857.

1542.—LOUIS LAURENT BEQUEMIE, of 30, Rue de la Douane, Paris, for "*Improvements in cocks.*" June 1, 1857.

Legal Intelligence.

THAMES POLICE COURT.

WEDNESDAY, AUG. 26.

(Before Mr. YARDLEY.)

THE POPLAR DISTRICT BOARD OF WORKS *v.* KNIGHT AND WEITZELL.

This was an application to recover the expenses of demolishing certain houses which had been built and erected without due notice, and contrary to the orders of the District Board of Poplar; and of reinstating a sewer, called the Marsh Wall, which had been broken into without the consent of the District Board, for the purpose of building such houses.

Mr. TOULMIN SMITH attended to support the application, on behalf of the District Board; Mr. BECK (solicitor) attended for the defendants. The case was an exceedingly important one, involving, at the same time, a striking example of the ignorance of the promoters of the Metropolis Local Management Act, 1855, as to the law of sewers, and a proof of the impropriety of leaving the application of an Act of so much importance to the summary jurisdiction of a single magistrate, in cases where the facts will generally be complicated, and the public injury done by an erroneous decision be grievous. As the case was finally adjourned to Wednesday next, Sept. 2, it will be sufficient if we now give an outline of the facts and argument.

Mr. TOULMIN SMITH stated that this was a proceeding under sections 76, 83, and 204 of the Metropolis Local Management Act, 1855. The Isle of Dogs constituted part of the district under the jurisdiction of the Poplar Board of Works. The maintainance of the sewers there was a matter of the highest importance, the Isle of Dogs itself being 7 feet below high water mark; and, therefore, destruction impended over all property there on any neglect of the defences or "sewers," as they had from very ancient times been called, provided for the protection of the land. The terms of the statute of sewers, of 23 Henry VIII., c. 5, showed such a case as this to have been always a primary object of commissions of sewers; while the modern Sewers Act of 3 & 4 William IV., c. 22, also recognized sea-walls as the first objects of care comprised within the term "sewers." In the present case, so important had the state of facts always been felt to be, that there had, up to the year 1848, been a separate commission of sewers for the Isle of Dogs, under the name of the "Poplar and Blackwall" commission, the main object of whose attention was the sewer or sea-defence commonly called the Marsh Wall. By the 11 and 12 Vict. c. 112., all the metropolitan commissions of sewers were united; the functions of this one, among the rest, becoming thereby vested, unimpaired, in the Metropolitan Commission erected under that Act. The Metropolis Local Management Act, 1855, abolished the Metropolitan Commission, and professed to vest the functions held by the latter in vestries and district boards, reserving some special instances only in a metropolitan board. The Marsh Wall of the Isle of Dogs was not named, and thus reserved, in schedule D of that Act. It logically followed that this very important sewer was vested in the District Board of Poplar. He (Mr. Toulmin Smith) was bound however to say, that the terms of the Act were so vague, and were so ill-adapted to meet the actual state of facts in many metropolitan districts, that it was not easy to affirm the actual effect of those parts of it which professed to relate to sewers. He referred particularly to sections 68 and 138, and to sections 83 and 204. It was quite clear that the important sea-defence, in the present case, was not vested in the Metropolitan Board of Works. If, therefore, it was not now vested in the District Board of Works, it, and many miles of similar defences along both sides of the Thames, were, by the operation of Sir B. Hall's Act, left totally unprovided for, to the serious and alarming danger of the public. In the present case, the defendants had cut away 32 feet in length of the Marsh Wall, contrary to the orders, and without the knowledge or consent of the District Board; and they had built houses on the spot, without giving to the District Board the notice required by section 76 of the Metropolis Local Management Act. Had the Act been clear and intelligible in its most important parts, the District Board might have proceeded at once in respect to the damage done to the Marsh Wall. Under existing circumstances, it was better to rely chiefly on section 76, fortifying the proceeding by including sections 83 and 204. It was plain that the importance of the position chosen for digging out foundations could not lessen the power and right of the District Board to insist on the strict fulfilment of the requisitions as to notice, &c., made by section 76. On the contrary, it increased the necessity and responsibility for doing so. The foundations of two houses, out of six, had been here dug out of the actual body of the Marsh Wall, without any notice whatever given to, or consent had from, the District Board. The District Board had made repeated attempts to induce the defendants to reinstate the injury they had done. Instead of doing this, the latter had proceeded with building houses there, contrary to the orders of the District Board; the District Board had no resource but to demolish those houses; which they had accordingly done, under section 76; and they now sought to recover the expenses.

Mr. *Ceeley*, clerk to the District Board of Poplar, and Mr. *Parker*, clerk of the works to the same board, were called to prove the facts of the case.

Mr. YARDLEY said he felt a doubt as to the meaning of section 83, which would otherwise plainly apply. Section 76 seemed directed to drains only.

Mr. TOULMIN SMITH entered at length into the construction of section 76, showing that it included reference to two distinct things, its terms, in referring to them, being in the disjunctive. It referred to laying foundations of houses, and also, but as a distinct thing, to making new drains. Each of these was separate, though the two would, undoubtedly, be often, but not always, connected. Section 143 showed that the provision as to foundations was important in itself, apart from the drainage arrangements. On the other hand, new drains are constantly made without digging new house-foundations. Under any circumstances, it was required, by this section, that notice should be given before digging foundations, and that no buildings should be erected contrary to order. In this case, the foundations had been dug out without any notice, and the buildings had been erected contrary to order. That the foundations had been dug out in the ancient sewer called the Marsh Wall, was simply an incident; but it was an incident that added to the responsibility of the District Board. Foundations must always be dug somewhere. That they were dug in such an improper place, could not make the section inapplicable. If it were held to do so, it would amount to declaring that the more grossly any one violated his obligations, the freer he would become from liability to make redress, and that he might take advantage of the excess of his own wrong. The District Board might, it is true, have relied upon sections 83 and 204 exclusively, had those sections been intelligible. As the case stood, however, though their remedy would be neither so satisfactory nor so complete, they were plainly not only justified in proceeding under, but bound to rely chiefly upon, section 76. The defect lay in the looseness and imperfection of the Act, of which those who had to administer it were, unfortunately, obliged to make the best they could.

The case was finally adjourned till next Wednesday, September 2.

Miscellaneous News.

PHŒNIX GASLIGHT AND COKE COMPANY.

The Adjourned Half-Yearly General Meeting of the Proprietors was held on Wednesday, the 19th ult., at the Bridge House Hotel, Southwark, for the purpose of receiving the directors' report, to declare a dividend to midsummer last, and on other business.

J. E. JOHNSON, Esq., took the chair at one o'clock.

The SECRETARY (Mr. Pridden) read the advertisement convening the meeting, and also the minutes of the last half-yearly meeting and the *pro forma* meeting (pursuant to Act of Incorporation), from which this was an adjournment.

On the suggestion of the chairman, the report and accounts, as published in our last number, copies of which had been sent to each of the proprietors, were taken as read.

The CHAIRMAN then said: Gentlemen, I will take upon myself now to move the first resolution, which is, "That the report of the court of directors, with the accounts, be received and entered upon the minutes." I do not ask you to pass them, nor do I wish to preclude any honourable proprietor from offering such comments upon any portion of them as he may desire. In submitting this resolution to you, I will take the opportunity of making a few remarks upon the accounts themselves, but I shall not do so at any great length. And, in the first place, I would observe that these accounts are very similar in many respects to the accounts which were laid before you for the previous half year—particularly close indeed. For instance, last half year the cost of coals was 16s. 2¾d. per ton; this half year they are 16s. 1¾d. "Tradesmen's bills" last half year were 4s. 3d. per ton; this half year they are 3s. 10d., calculated upon the quantity of coals used, viz., 32,509 tons. The item of "Law" is scarcely worth noticing, being only £8. 4s. "Retorts used" were 3½d.; they are now 4½d. "Meters" were 1s. 1½d.; they are now 1s. 3d. "Rents, rates, and taxes" were 1s. 2d.; they are now 1s. 1½d. "Directors and auditors," in consequence of an act of great liberality on your part, are increased from 4d. to 6d.; and "Salaries," which were 1s. 6½d., are now 1s. 8½d., in consequence of the higher rate of remuneration which has been awarded to our officers. The next item is "Wages," which is increased from 5s. 2½d. to 5s. 4½d.; and then follows—"Bad debts and overcharges," which was 4d., and is now 4⅜d. The item for "Reserve for depreciation on plant and leasehold property" is 1 per cent. for the half year; and, deducting all these sums, they leave a net profit of £15,782. 10s., or 9s. 8½d. per ton as compared with 10s. 1d. on the previous occasion. On the other side of the account there is "Rental for light," which amounts for this half year to 216 per cent. on the cost of coals per ton; in the previous half year it was 216½; so that the returns under this head are as near as they well can be. "Coke made for sale" in the last half year produced 9s. 8d., but I am sorry to say that this half year it has realized only 8s. 6½d. Last half year we used 22½ per cent. for fuel; this half year it is only 20 per cent. Breeze, which was down at a low price before, viz., 2s. 8d., is now 2s. 4¾d.; then it was 5 per cent. upon the quantity of coal used, now it is 5½ per cent. Our tar produced us 2827 butts last half year; this half year it has produced 2980. Last half year it was calculated at 7s. a butt, and there were 76 butts short. There was not, however, so much loss unaccounted for; as sometimes the coals do not yield the same quantity, and at others we use a considerable quantity of tar ourselves in covering our gasholders, &c. As I said, last half

year our deficiency was 76 butts; this half year it is only 30. We have never had it so close upon any previous occasion, and my own view of the matter is that this is a very satisfactory result. In reference to ammonia, last half year there was an excess of quantity, and this half year the increase is amazing, being 338 butts more than the calculation of 10 gallons per ton will justify us in expecting. This fact leads necessarily to the conclusion that we are taking great pains in clearing our gas from ammonia, and that we do get a great deal from it; that is, I believe, the proper explanation. The "Interest received" is much about the same as before. With respect to the question of waste, I may mention that last half year it was 15 per cent. upon the quantity of gas made; this half year it is only 14 per cent. We think this small even as it is; still, we have reason to hope that, by the course we are now pursuing, we shall be able to make yet further reductions. We know very well that the waste in the London works is considerably less than at the works at Greenwich, and we believe the cause of it to be that in the former we have spent a large sum of money in putting the works, gasholders, and mains into good order. We have not had time to do that at Greenwich as yet, and we find the waste there is very large, being no less during the last half year than 28 per cent. Incorporating that with the waste at the London works, we bring the total down to 14 per cent., but we believe the waste at the London works alone is not more than 11 or 12 per cent. So excessive has the Greenwich waste been, that the directors have felt it to be their imperative duty to go into the question of the state of those works at great length, and they have deemed it necessary to erect a gasholder there of a large size, and to take up many miles of old mains, replacing them with others of a larger and better quality. The sight of some of these old mains which we have taken up would surprise you very much, and lead you to conclude that the life of a gas-pipe is, after all, of no great length; that it does require periodical renewing, and that it is the worst possible economy to be niggardly in this branch of expenditure. We are now spending £11,000 or £12,000 upon the Greenwich works alone, and we sincerely hope that the result will be to bring them into a very satisfactory state. You will perceive that there is a new item in these accounts—it is that under the head of "Investment fund," £500. We have always placed before you an item of "Reserve for depreciation on plant and leasehold property," and it has been generally felt by all the proprietors, and, indeed, by the directors themselves, that the amount deducted under that head would be sufficient to meet all claims for contingent purposes. But when we come to look carefully at the expenditure for the last five years, and find that we had to invest upon plant and new works the sum of £50,000, being £30,000 from the amount written off for depreciation during that period, and the remaining £20,000 by calls and other means, it is quite clear that so long as such a large expenditure for new works is necessary, the reserve we have hitherto made does not cover it, and that we shall not only be obliged from year to year to draw the amounts so written off for depreciation, but to infringe upon the sums in hand. You are aware that a considerable portion of the property of the company at Bankside and Wellington Street is leasehold, and the time is coming when the leases will expire. I have reason to believe that the freehold of the property at Bankside might be purchased, but we are unable to embrace the opportunity as we have no capital in hand to make the purchase with, and we are unwilling to go to the proprietors and ask for more money. We think, however, if the proprietors will support us in putting aside a depreciation fund of this kind, to be called an "investment fund," we shall be prepared for any contingencies which may arise, and especially for the purchase of the freehold of the present premises at Bankside and Wellington Street. This sum will be invested at once, and kept sacred for the purpose to which it is designed. If the proprietors think proper to appoint trustees, in whose names it shall be invested for greater security, we, as your directors, will be happy for them to do so. Whichever way they choose to do it, the money so invested will have added to it the interest as it comes due, and such further sums as from time to time we can spare, so that ultimately we shall have a fund, out of which, as opportunity offers, we can purchase the freehold of our property, without taxing the proprietors for other calls. It is possible we might set aside a smaller depreciation fund, but the result would be that, though you could have larger dividends now, you must eventually meet calls, in order to provide the necessary capital for carrying on the concern. We therefore propose that you should allow this amount to be reserved for depreciation. It will be nursed with every possible care; not a farthing of it will be spent; and if, in a few years' time, we find it not necessary to expend this amount for renewals, we shall be happy to tell you so; and we, in common with you, will be benefited by receiving a larger dividend. We have all one common interest in the concern, and the directors suggest to you, after full consideration, that this amount we are asking is not an unreasonable one with the present demands upon us. Gentlemen, with these remarks I shall ask you to receive the report and accounts, and direct them to be entered upon the minutes.

Mr. RHODES seconded the motion.

Mr. PILCHER: What would be the sum required for the purchase of the freehold at Bankside? I think it would be very desirable to purchase it at a price.

Mr. R. A. GRAY: I think you had better not ask that question.

The motion was then put and carried.

Mr. GIBBES (deputy-chairman) said their excellent chairman had so fully entered into the subject of the report just laid before the meeting, that the duty devolving upon him as deputy-chairman was a very light one. Such as it was, he had great pleasure in performing it; and certainly must offer the proprietors his congratulations upon the greatly increased prosperity, as indicated in the half-yearly report of the company. There were, however, a few special points in that report on which he felt it necessary to call their attention, because the chairman had already explained every item. It was proverbial amongst all gas companies that the coke account at the present time, and for the last two or three—perhaps he might even say four years, had been a very losing concern. The directors regretted but could not rectify that state of things; any exertion which they could put forth must be fruitless; and he feared that this company, in common with others, must continue to submit to a low price for that article, unless some unforeseen and extraordinary demand for it should arise. There was one paragraph in the report to which he wished specially to call attention, viz., the second, in which the directors stated that, "since the last meeting of the proprietors, their attention had been much engaged in carrying out extensive additions to your Greenwich station. The renewal of the wharf wall on the creek side is being continued. A considerable extension of the ground into the River Thames is being made, and a tank (to contain a new gasholder) is in course of construction. An old gasholder has been renewed, and doubled in capacity. New storehouses are being erected, and the station-meter-house is being rebuilt. The supplies of gas to the higher and lower grounds have been re-arranged, and made independent of each other. Large mains have been laid through the town, in place of small and faulty pipes, which have been taken up." The Greenwhich station had been, unfortunately, left to itself for many years, but he believed they were now putting it into such a state of efficiency, that not only would it hereafter tell upon the dividend, but be a saving of a large item of constantly recurring expense. In executing the works referred to in the passage which he had read, they had taken up pipes in a complete state of rottenness, proving that the loss sustained by the company upon that account, from leakage, must have been very great indeed. He did not, however, dwell on this point, and only referred to it in order to account for the last half-yearly cost. The subject which he had to bring especially before the proprietors was that of the dividend; and he would not only assure the meeting that the proposed division was an honest one, but also congratulate them on its other distinctive characteristic of excellence, viz., its prompt payment. In most other gas companies, the proprietors had to wait from July to October, but in the Phœnix they had only to adjourn to the next room, at the close of the present proceedings, and take their money home with them. He thought some credit was due to the directors for making such an arrangement for the convenience of the proprietors. He concluded by moving "That a dividend, at the rate of 3½ per cent. (free of income-tax), for the half year to Midsummer last, be now declared; and that the same be payable immediately after the business of the meeting had terminated, and afterwards at the company's office at Bankside, on Thursday, the 20th inst., and also on Monday, the 24th inst., on both days from the hour of twelve till three, and from that time on Wednesdays only, from two till four o'clock."

Mr. R. A. GRAY said, on former occasions he had expressed his surprise that the proprietors had not derived greater benefit from the success of the establishment than they had done. He quite agreed in all that had fallen from his honourable friend in the chair as to the propriety of maintaining an adequate reserve for deficiencies; but there was a limit to everything, and he was decidedly of opinion that, in the present case, much more was being applied to a redemption fund than ought to be. He found, by referring to a former period, that in the 25 years between 1830 and 1855, various sums, amounting in the whole to £102,000, had been written off in redemption of plant. This certainly showed that the directors who presided over their affairs during those years had clearly in view the importance of making a sufficient reserve for such contingencies; and he mentioned it to prove that the proprietors had not heretofore received a larger amount of dividend than they ought to receive. The amount that was now sought to be written off was between £9000 and £10,000 per annum, and he would assert fearlessly that it far exceeded the necessities of the case. What was the effect of writing off such large sums for depreciation? Why, that the shares of the company were at a discount of 10 per cent. at the present moment. The gross annual profit of the concern was above £40,000, and out of that £10,000, in round numbers, was deducted. In fact, the total amount set aside for depreciation and redemption of plant was about 33 per cent. of the profits of the concern; and he said fearlessly that that was an amount that could not be justified. His excellent friend in the chair had told them that the directors did not wish to make a call. He (Mr. Gray) did not desire that there should be one, but at the same time he must say that he did not see why the present proprietors should be deprived of their dividends because the directors were desirous to avoid a call in future years. He was sure, if the directors could show to the proprietors a good reason for making a call, they would readily respond to it. In former times, when the shares of the company were at a large discount, the directors very naturally felt a reluctance to take such a course, feeling, as they well might, that every additional call tended to depreciate the property of the shareholders; but now they were in a very different position. Then, as to the proposal for an investment fund. In the accounts just presented, there was an item, "Investment fund, £500," and this was an insidious way of increasing the amount written off. The question for the consideration of the proprietors was principally this—"Do you believe that there is any necessity, in order to uphold the interests of the company, to set aside so large an amount of money every year?" He (Mr. Gray) was of a different opinion to the directors on this subject, and he felt that the present proprietors were entitled to receive a larger amount of profit from the undertaking than they had hitherto divided. Looking to the accounts, he found also an item of depreciation of meters; so that no less than £11,000 for depreciation had been written off from the entire account. This half year £600 was taken on this item (and about the same last half year), while as much as £816 was charged for "meter repairs." One would think that the latter sum was sufficient to keep them in repair without any depreciation at all. The proprietors had been told in that room by a meter-maker that, with proper care, a meter would last from 15 to 20 years.

The CHAIRMAN intimated his dissent from such a statement.

Mr. PERRY corroborated Mr. Gray's remark, and said the same gentleman remarked that he had a meter which had been in use twenty-five years.

The CHAIRMAN said that that was certainly a solitary instance.

Mr. GRAY said he had no right to impugn the veracity of the gentleman who made the statement. All he could say was, that it was a direct answer to a direct question, and whether, in giving it, the person referred to deceived the meeting on the subject, he (Mr. Gray) could not be responsible for deciding. He did not know what the opinion of the proprietors might be, but for himself he felt that the amount proposed to be set aside every half year was much too large. He believed there was some apprehension that if the proprietors got too large a dividend they would be met by an opposition company. But that was an argument which would always apply; but, practically, it was not the case where much better dividends were realized. He could see no reason why this company should not pay 8 per cent., not, perhaps, during the present half year, because so much had been written off for depreciation, but on future occasions. He was anxious to know the opinions of the proprietors by whom he was surrounded; and if he found that in principle they concurred with him, he would submit a substantive resolution in respect to the proper sum which should be set aside for depreciation of plant.

Mr. JOSEPH BOX inquired whether the company received any rental for meters?

The CHAIRMAN replied in the negative.

Mr. JOSEPH BOX wished to offer a remark or two upon what had fallen from Mr. Gray. The honourable proprietor had called the attention of the meeting to the fact that a sum of more than £100,000 had been written off for depreciation of plant. He (Mr. Box), as an old proprietor, could recollect very well that when the proposition was originally moved and carried that a sum should be written off, it was understood that a certain per centage should be reserved for the purchase of the property, as the leaseholds were wearing out, making it freehold if possible, or if not, of renewing the leases. But he thought that his friend Mr. Gray had omitted to state one thing which the shareholders should be made acquainted with. They would find by referring to the balance-sheet that the sum expended during the past

half year in extension of works was £2769. 19s., and nearly the same sum was laid out in the same way on the previous occasion.

The SECRETARY: It was £3047 the previous half year.

Mr. BOX not having the figures by him could not say exactly, but believed that for the year it was nearly £8000. That sum was gone in extensions and improvements, and by using it the directors had been saved the necessity for making calls. The auditors had paid as much attention to the accounts of the company as gentlemen well could do, and they had no hesitation in appearing before the meeting to declare that they believed them to be true and faithful accounts, and they had unanimously agreed to append their signatures to them. In saying, therefore, that £100,000 had been written off, they were dealing entirely with an imaginary sum; they had not got the money in hand, nor could they get it from any source; and it was, taking this view of the subject that the board of directors deemed it advisable that a certain proportion of profits should be written off in future years, in anticipation of what might become necessary. He concluded by inquiring of the chairman whether he was correct in supposing that the leasehold property of the company at Bankside had about 7 or 8 years to run?

The CHAIRMAN: It has nearly 30 years to run.

Mr. BOX: What, the old works?

The CHAIRMAN: No; they will be out directly. They have about 3 years to run.

Mr. BOX: If I mistake not, that is the portion of property which the directors have it in contemplation to purchase?

The CHAIRMAN: No; not at all. It is the new works at Bankside, the lease of which has 30 years to run.

Mr. BOX: Then I am in error. I think we must look fairly at all these matters; and if we wish to be in a position to purchase freeholds, as opportunity offers, we must begin by laying aside something every year. Whether the £500 which the directors have set aside for an investment fund be too much or too little, I must leave others, who are better judges than myself, to decide. It is true we have £30,000 in hand, which is out at interest——

The CHAIRMAN: That is very much reduced now, and will be more so when we pay the dividend. It will be reduced to £6000 or £7000 before Christmas.

Mr. BOX: Looking at the thing fairly and honestly, I cannot but congratulate the shareholders upon the present improved state of the concern. I believe it is in a healthy, prosperous condition, and I believe all the officials (so far as it has come within my knowledge and observation) are very assiduous and attentive to their duties. I think so, and if I thought otherwise I should tell you. I second the proposal made by the deputy-chairman.

Mr. HORNER (a director) suggested to Mr. Gray that it would be better to embody his views as to the reserve fund in a proposition, and submit it as an amendment.

Mr. GRAY replied that he was waiting to elicit the sentiments of the proprietors as to what should be the amount, and then he would submit a resolution. He was decidedly of opinion that, for all the objects they could have in view, and for keeping the works in an efficient state of repair, £5000 a year would be a sufficient sum to set apart. That £5000 ought to be invested, with the £500 proposed by the directors, in the name of trustees, and become an accumulating fund. (The chairman shook his head.) His worthy friend in the chair shook his head, but he (Mr. Gray) would tell the meeting that it could be done without any inconvenience to the concern, because there was already a balance in hand of £50,000 for working expenses, and, in addition to that, they would have £22,000 left after paying the dividend, which, with the former amount, made £72,000. Added to this, the company were periodically receiving rents. He undertook to say that, from the 25th of December to the end of June, they must have £20,000 at least in hand, making together £92,000. He quite believed that it would be well to buy the freehold of their property, but, at the same time, he was anxious that the proprietors should receive more than they did at present—to what extent he was not exactly prepared to say. He would now propose that for the future a sum not exceeding £5000 should be set aside annually for the depreciation of plant.

Mr. BAILEY (auditor): Do you propose that it should be invested, and the interest added to the principal?

Mr. GRAY: I have no objection.

Mr. HORNER said his friend Mr. Gray had told them that upwards of £100,000 had been written off for depreciation since 1830, and nearly £10,000 was now being written off per annum. But he had not told them that a large amount of capital also had been called up. Mr. Gray proposed that £5000 should be the sum written off in future, and that that sum should be invested. He (Mr. Horner) would like to know, if the amount written off for depreciation every year were taken out of the concern and invested at interest, where the money was to come from for providing capital for the constant extension of the plant?

Mr. GRAY: Make calls.

Mr. HORNER continued: How would the directors be able to extend their works, and thus make the money fructify, and become the means of bringing in untold interest? Take the item of the cost of meters alone. The proprietors had been told that the total present leakage was only some 14 or 15 per cent. Four or five years ago, it was above 30 per cent. How had it been reduced? Why by laying out money upon meters, and putting them into an efficient state, which they never could be if they had to last twenty-five years, as it had been suggested they would do. The proprietors might depend upon it, it was more truly economical to renew them every ten years. When they were told that the present leakage was only 14 or 15 per cent., he believed they might congratulate themselves upon the circumstance, for certainly no other company in the metropolis could say so. He therefore hoped the proprietors would not listen to the proposal made by Mr. Gray, as he was persuaded it would not be for the advantage of the concern. Mr. Gray had told them that the directors would have £25,000 in hand at Christmas, but he (Mr. Horner) would inform that gentleman that, after the present dividend was paid, the balance would be reduced to £17,000; and as the directors were extending the works at Greenwich, the amount in hand at Christmas would be only some £7000. He would ask them, were they to be called upon every year to invest £5000, which was positively required for outlay upon the works? If they did, what course must the directors pursue? Having placed the money in the bank, they would have to convene a meeting of the proprietors, and make a call. He felt convinced that the course at present adopted was the most prudent one, in proof of which, they were now for the second time paying the best dividends that had ever been paid by the concern. Let the proprietors take warning from companies on the other side of the water, who had paid away every farthing of their profits in dividends, and then, when competition came, were obliged to make calls to carry on their works and maintain their ground. He hoped this company would not follow their example. He was quite satisfied that the great majority of the proprietors, many of whom were not present on that occasion, would be horrified at the idea of anything like a call being made, and it was certain there was nothing which so much deteriorated the value of that class of property as a call for more capital.

Mr. PILCHER hoped the amendment would not be seconded, because the real point involved was, "Have the proprietors confidence in the directors?" The question of the amount necessary to be written off for depreciation was one which must be left entirely in their discretion. He submitted to Mr. Gray the propriety of withdrawing his amendment.

Mr. GRAY said, if the question at issue were really what was stated by Mr. Pilcher, he would withdraw his amendment at once, for no man present had more entire confidence in the directors than he had. But, at the same time, he thought every proprietor had the right to challenge the propriety of any particular step which they had taken; and therefore, if his amendment were seconded, he should persevere in it.

Mr. BOX: What is the extent of area which will be recovered from the river at Greenwich when the wall is built?

The CHAIRMAN: One-third of an acre.

Mr. SANGSTER was always sorry to differ from the directors, as he felt he was obliged, to some extent, to do on this occasion. They were all liable to commit errors; but, if they were only open to conviction, it might so happen that, in the expression of a variety of opinions, they might hit upon a course which was a decided improvement. In looking over the accounts, he found that this half year they were writing off a sum of £6104.

Mr. HORNER: No; it is only £4000 odd.

Mr. SANGSTER said, there was £4184 for depreciation on plant and leasehold property; £500 to form an investment fund; £604 for depreciation of meters; and £816 for repairs to meters. If those amounts were doubled for the two half years, it made £12,208, which certainly was a frightful sum, and larger, as he thought, than in justice to themselves they ought to write off. Whether £5000 was or was not the exact sum which should be written off yearly was a question for the directors; and he merely threw out the idea that the present sum written off was more than necessary. If they always wrote off what the directors wished, they might have to write off half their profits; and therefore it was for the proprietors to judge, and to express their opinions to the board. He thought Mr. Gray had done quite right in bringing this subject under consideration.

The CHAIRMAN: Certainly.

Mr. SANGSTER said, there was an item in the balance-sheet of "Undivided balance, £12,000"—he supposed that formed a portion of the floating capital of the concern. For the sake of discussion, he would second Mr. Gray's amendment, though he was not prepared to say that £5000 was exactly the sum which should be written off.

Mr. TILLEY said that, speaking in the presence of two gentlemen of such great experience in gas matters as Mr. Gray and Mr. Sangster, and whose opinions carried great weight with them, he felt some little hesitancy in expressing dissent from their views. In the first place, looking at their capital as a manufacturing capital of nearly £500,000, and having some experience as a manufacturer, he was convinced that from £5000 to £10,000 a year was not too much to write off for depreciation of plant and manufacturing stock. In this view of the case he believed that any gentleman present who was a manufacturer would bear him out. As to whether this would always hold good in reference to gas he was not prepared to say, but that a very large amount of depreciation was constantly going on there could be no doubt. Recently he had seen some gas-pipes belonging to this company taken up which were utterly valueless. In Greenwich they had removed them, and found holes in them so large that they were not worth the price of old iron. Would any one say that £10,000 a year was too much to write off a capital of £500,000, invested in such a perishable stock as this? They should also remember that it was not all for depreciation that was written off; much of it was required to meet the increasing business of the company. He should be very sorry, having witnessed in that room the great difficulty of meeting with a response, to be one of the directors, when the board felt it necessary to come forward and make a call. He thought it was much better, now that they were in prosperity, to make suitable provision for all the exigencies which might arise at a future time.

Mr. PERRY: I perceive that for the extension of works there has been a sum of £2769 expended the last half year. Is that amount added to capital?

Mr. HORNER: When it is new work it is added to capital, of course.

Mr. PERRY: I think it a matter of some importance that we should know whether the £30,000 out at interest the directors have good security for.

The CHAIRMAN: The security is in bills. We have, first of all, the security of the bankers; and, secondly, approved bills as collateral security. From time to time those bills are carefully inspected to see if they are all of the first class; so that if the bankers go wrong, you still have the security of the bills, which are thoroughly good.

Mr. PERRY: When these bills run out, do you have others in exchange?

The CHAIRMAN: Certainly.

Mr. PERRY: On the subject of depreciation, I will take first the meters. I find the charge for repairs is very large—£816—but I do not see what is the value of your meters.

Mr. GIBBES: The depreciation is 10 per cent. per annum upon the total value of them.

Mr. PERRY: I have before stated that meters will last from 10 to 15 years. I have seen it and known it, and have no doubt at all upon the subject. I have heard since I have been here, with great surprise, that the Greenwich works have been much neglected for many years. Is it possible that our worthy directors have been neglectful of a branch of such great importance; that they have left it for 10, 15, or 20 years without doing anything to keep up its efficiency, till things have got into such a state that they now come and tell us the pipes which are taken up are not worth the price of old iron? I do not know how to believe that our directors have been so inattentive. I would suggest for the future that a separate account should be kept of the rental of the Greenwich works, so that we may know what profit we make there.

The CHAIRMAN: I have an account with that separation made in it before me on the table.

Mr. PERRY: Then I am sure we should be happy to hear whether it will be advantageous to continue those works.

Mr. A. PELLATT: I should like to make one or two observations before the chairman replies. Our friends will consider whether the amount of plant was too highly valued at Christmas last at £418,469. That is the real question before us. What we have written off or put for depreciation goes for nothing, when you ask whether this is the worth of your concern. If it is, then too much has not been written off. My opinion is that it is not too much, and, amongst other reasons for thinking so, I will state that I was told by a previous deputy-chairman that our predecessors paid for the old South London Works £90,000 more than the concern cost. If we, therefore, have written off £100,000 for depreciation in

the last 25 years it is not too much, because it simply reduces the capital to the amount which ought to have been paid. Keeping this fact in mind, and remembering the higher price which we paid for iron than many other companies—(one in our own district, which came in when iron was so much lower) their capital, nominally less in reality, represents much more than ours—I think you will see the necessity there is for our writing off a larger amount for depreciation. Then, again, can we say that coal will not be higher, or that coke—depreciated though it already is—may not go even lower? Let me remind you that coke has been depreciated in the market because of the scientific improvements made in our own and other gas manufactories. We are now selling four-fifths—*i. e.*, allowing 20 per cent. for waste and consumption—to bring into our coffers as much money as we formerly obtained by the sale of one-fifth or two-fifths. You are, therefore, bringing double the quantity of coke into the market, arising out of the improvements in manufacture, to realize the same return. There is only one thing which may tell in our favour in reference to this article, and that is, that next year the Smoke Prevention Bill will be in operation without exceptions, and glass-workers, and potters, and others, who have hitherto been exempt from its provisions, will have to burn a smokeless coal, or must resort to coke. That will necessarily increase the quantity of coke consumed. I would only say, in conclusion, that I think the proprietors should permit us to keep such an amount in hand as will save the necessity for further calls, enable us to purchase our own freehold, and meet any competition which may hereafter arise.

The Chairman: I cannot for one moment object to any remarks which have been made. We have met here for the purpose of consulting what will be the best course to adopt for our common interest, and the security and extension of our joint property. If, therefore, an honourable proprietor feels that he can make a suggestion by which his fellow proprietors as well as himself can be benefited, it is our bounden duty to hear him with attention and with respect. I feel, therefore, no objection to the proposition being submitted by my friend Mr. Gray, but I regret that I cannot concur in it. I cannot help feeling, too, that in placing it before the meeting, he has not supported it by any argument which upon a close investigation can have any weight attached to it. In the first place, he tells you to look at the state of your property, the value of your shares, which, he informs you, are now positively at 10 per cent. discount. Now, no one can deny this; it is a fact; but what would he infer? He would infer that, because you are taking 1 per cent. for depreciation every half year, you are damaging the value of your shares. Let us look back a little to a former period, to 1851 and 1852, when you took a quarter per cent. for depreciation. What was the value of your shares then? They were then not at 10, but at 60 per cent. discount! So far, then, from the fact of an increased depreciation fund damaging the value of your shares in the market, it appears to have had a directly contrary effect; and I have no hesitation in saying that I believe such would naturally be the effect produced. Then, when speaking of meter depreciation, we are told that a meter will last twenty years if fairly used. Now, that's another truth, and no one will deny it; but then, unfortunately, your meters are not fairly used. They are fixed in all kinds of places, in coalhouses, and areas, and vaults, and they suffer immensely; so that we find from two and a half to three years is, in fact, the average life of a meter. And remember that, when they become defective, if we do not take them down and renew them, we do not get paid for a large amount of gas consumed. In consequence, therefore, we are obliged to keep our meters in good order, cost what it may. Then, look to the item of depreciation upon the cost of meters. You have been told to-day, that we are taking £12,000 a year for entire depreciation, but I think it can be shown that the amount is not so much. "Meter depreciation" is set down in this account at £604, and that is part of the amount which you are told we are putting aside to play with, and that we might and ought to give it to the proprietors. Let me ask you to consider what we do with it. We have a meter account; there is a debtor and a creditor side to it, and every farthing of depreciation goes at once to one side of the account; and out of that amount so carried to account this half year, what have we done? We have purchased 230 new meters, in lieu of meters condemned as utterly worthless. If you do not give us anything for meter depreciation, we shall have to charge for all new meters in the general account, and you will find your expenses under that head correspondingly larger. It is only a mode of keeping the accounts, and we think it advantageous that you should know absolutely what your meters cost you from time to time. It is not money put aside, but money spent in purchase of new meters. Then comes the question of depreciation generally, and here I cannot but comment upon the terms of the proposition submitted by Mr. Gray as an amendment. It is to lay aside for depreciation not more than £5000 per annum, and the money so laid aside is to be invested in the names of trustees, and the interest from time to time is to be added to it. What would be the consequence? Why, that your directors would have, for new works, for extensions into new districts, for laying down larger mains where smaller ones have been found insufficient, not one single farthing, but they would have to come to you on every occasion, and ask you to give them money to carry on the concern efficiently. Now, as I told you before, we are expending in this class of works, upon an average, £10,000 per year—a larger sum than you give us for depreciation, and we ask you to continue to give us the £8000 odd on that account, so long as these expenses last. When they are no longer necessary, we shall be happy to tell you so. But how is this to be done if you do not sanction our writing it off as depreciation? We are told, it is to be done by calls, and that to those calls the proprietors will cheerfully respond. I recollect a very strong remark that was given utterance to the last time we made a call, viz., that the directors ought to be ashamed of themselves for proposing it. Let me tell you, there was a time when we could not make a call. Your property at one period was in such a depreciated condition that the proprietors themselves doubted whether it was worth the value of a call at all—whether it was not like throwing good money after bad; and it was not until we had made arrangements with other companies, and were able to lay before you a reasonable prospect of a fair return for your money, that we durst venture upon the experiment of making a call. Then, I admit, you did most liberally respond to it; and what has been the result? Why, in consequence of your liberality, your dividends have gone up from 3¼ per cent to 6½. Please, therefore, to remember that this money is only so much laid out to bring a better dividend to you in the future. Seeing that our absolute outlay is so much, we ask you, so long as that expenditure lasts, to give us this 1 per cent. I feel quite certain the proprietors will forgive us for trespassing so long upon their time, and will continue to yield us the support we have hitherto received. There is, however, one other matter to which I must refer. I was asked by an honourable proprietor for some explanation respecting the Greenwich branch, and in answer I say that it was in a very neglected state; indeed, I am bound to state that the whole of our works were much in the same condition. What was the case in 1848, when you did not give us one farthing for depreciation, because you were not able? How were the directors to go to work and do anything at the home works, or at the Greenwich branch? As the result of your liberality, we have been able since then to go on repairing those neglects. What the result would have been if something had not been done, I cannot say. We must plead guilty to the charge of doing nothing, but then we did nothing from necessity. It will not be so, I trust, in the future; and I hope, moreover, that in our subsequent accounts, the waste at Greenwich will be found to have very much diminished.

Mr. Gray: After the explanations which have been given, I will save the chairman the necessity of putting the amendment. I have done what I wished; and I have no desire to press anything in opposition to the directors, because, as I said in the beginning, I have the highest opinion of them. With their assurance that they will only write off so large a sum for depreciation while the necessity exists—that will satisfy me; because my honourable friend in the chair is incapable of misleading any one. I think he told us that all the mains, except those at Greenwich, were in good repair. Very well; the time will come when this outlay will cease to be necessary; and then I take it our directors will give us the benefit of having this amount divided among the proprietors. With permission of the seconder, I will withdraw my amendment.

Mr. Sangster said he had no objection to that course, though he must say that he did not agree with the chairman when he intimated that the prosperity of the company arose from the amount which had been written off for depreciation.

The amendment was accordingly withdrawn.

On the question being put,

Mr. Rhodes said, he hoped the mode of making up the accounts would not be altered, and that each item of depreciation would still be kept distinct, as it appeared in the present half year's statement.

Mr. Box asked Mr. Perry whether he intended to press his proposition, that the account of the Greenwich rental should be kept distinct, and appear separately in the accounts, so that the proprietors might know where the outlay took place, and what was the extent of benefit derived from those works.

Mr. Perry said he was in the hands of the directors in this respect. He had merely suggested it as a means of enabling the proprietors to ascertain how much profit was made by that branch.

The Chairman: It shall be thoroughly watched.

The motion for declaring the dividend was then put and carried.

Mr. Gray, in proposing a vote of thanks to the chairman and directors, said he felt that he should be ill discharging his duty if he did not express his most thorough confidence in the board, and his hope that the directors would not regard his former proposition as brought forward in a spirit of opposition.

Mr. Box seconded the motion, which was cordially adopted.

The Chairman acknowledged the vote, and the proceedings terminated.

RATCLIFF GAS COMPANY.

The Ordinary Half-Yearly Meeting of this Company was held on Tuesday, the 25th ult., at the Company's Works, New Crane, Wapping—J. G. Hammack, Esq., chairman of the company, presiding.

The Secretary (Mr. J. Gill) read the notice convening the meeting and the report of the directors, which expressed the satisfaction of the board in meeting the proprietary to submit a statement of the company's operations to Midsummer last. The accounts presented had undergone a close inspection by the board and the auditors, and showed a profit of £3035. 13s. 1d., out of which the directors recommended a dividend at the rate of 5 per cent. per annum, clear of income-tax, leaving £1035. 13s. 1d. to be carried forward. The shareholders' register and the dividend-book had also been examined by the board and the auditors, and they had been found correct. The improved gas rental afforded the directors much satisfaction, and exhibited an increase on the year, as compared with Midsummer, 1856, of £1056, with a decrease in the cost of coal, for the same period, of £603. This result had been obtained by a greatly improved mode of manufacture, and the entire substitution of clay for iron retorts; thereby affording throughout the district an ample supply of light, as was evidenced by an entire absence of complaint either parochial or private. In common with others, the company had to regret a diminished receipt for coke. At the last meeting it had been stated, that additional storage for gas would be required to meet the greatly increased consumption. A telescope-gasholder had been erected capable of holding 153,000 cubic feet, and thus a greatly increased storage was obtained at proportionately small cost. An opportunity having presented itself to secure several freehold houses adjoining the gas-works, the directors gladly availed themselves of it, and on their site purposed erecting coal stores To carry out these alterations and improvements, attended as the accounts showed with beneficial results, the directors, although authorized to make calls when required, had hitherto refrained from so doing from a conviction that temporary loans were only needed, whereas calls remained as a fixed debt with dividends payable thereon. The board had, therefore, as occasion had arisen, borrowed money of their banker, or advanced it amongst themselves; and they now submitted to the proprietors, in order to meet the necessary expenses, the propriety of either making calls on the shareholders, or borrowing money upon bond. The following was the profit and loss account:—

Dr.				*Cr.*			
To stock	£ 605	5	4	By cash	£ 107	19	9
Trade charges	1,292	8	11	Sundries	123	19	2
Petty charges	86	11	0	Stock	241	13	0
Interest on loans	243	13	8	Light	12,748	17	10
Tradesman's account	169	10	1	Coke	2,395	16	5
Wages	2,157	3	2	Liquor	43	2	0
Coal	6,792	14	10				
Retorts	102	1	8				
Rent and taxes	333	10	6				
Directors	275	0	0				
Auditors	10	0	0				
Salaries	507	10	4				
Bad debts	34	9	11				
Overcharges and allowances	16	13	8				
Profit and loss	3,035	13	1				
Total	£15,662	8	2	Total	£15,662	8	2
				By profit and loss brought down	3,035	13	1
				Undivided balance	1,781	1	1
					£4,816	14	2

Mr. Chalmers inquired what would be the amount of outlay for the new works?

The CHAIRMAN stated that it was considered £4000 would meet all their requirements. In consequence of the demise of a gentleman who held a bond of the company for £1000, they had to pay it off to his executors; and £3000 would be required for other matters connected with the repair of the roof of the purifier-house, and other incidental charges.

Mr. CHALMERS suggested the propriety of making a call.

The CHAIRMAN pointed out that the disadvantage arising from such a course would be, that dividends would have to be paid upon the money so raised for all time; whereas, if the money were borrowed, they would be able to redeem it at the rate of £1000 per annum.

Mr. CHALMERS would certainly adopt the course of temporary loans after the statement of the chairman that there was a prospect of paying off £1000 a year.

The SECRETARY, at the request of the chairman, then read a statement, showing that, since the year 1846, £18,431. 14s. 10d. had been expended upon the works.

The CHAIRMAN said: Gentlemen, it will be in your recollection that, at the time I last had the honour of addressing you, I ventured to assert that our consumption for gas was increasing so rapidly, that we should be obliged to endeavour to find some other place for additional storage. The Act which we have obtained confines us to an increase of our premises almost contiguous to our works. We attempted to procure ground for the purpose, but we were asked so extravagant a sum, that we were obliged to abandon it altogether. Happily, we found that by enlarging very considerably the area of one of our gasometers at the upper station, and by making a telescope-holder, we should be enabled to meet all our requirements. We accordingly entered into a contract for the purpose, and it ought to have been completed by the 21st of this month (August). The works have not progressed quite so rapidly as we should wish, but I expect they will be ready to meet the pressure of the winter. As we were raising a telescope to an enormous height, it obliged us to buy back some houses we had previously sold; and we have a call for £1000, which we did not anticipate. We have bought five freehold houses immediately adjoining the premises for the comparatively small sum of £375. That will enable us to make a coal store, by which we can avail ourselves of the advantages which the market offers. Indeed, I may assert that we were never in so healthy a position as we are at the present time; and I do most confidently believe that when the new gasometer is up, our works will be in a much more efficient state, and capable of supplying all the requirements of the district. (Hear, hear.) Gentlemen must bear in mind that the whole of the works have been rebuilt. We commenced with a debt. Only £20,000 was raised, and we paid £22,500; that was paid out of profits; and so we have gone on from that period. Gentlemen will also bear in mind that although we appear at present to be labouring under the want of cash, we are paying our dividend to-day before we are in receipt of it, because we cannot expect to get our rental for Midsummer so early as the middle of August, and if our dividend were postponed six weeks or two months, a great portion of the money would have been unnecessary. Therefore, I feel quite confiden that we shall be able to redeem the loan we at present require at the rate of £1000 a year. I think that is infinitely better than making a call, because many of the shares are held by executors and trustees. At the same time, it is necessary to receive your sanction to any course which may be adopted, and, therefore, the directors ask your advice in the matter. (Hear.)

Mr. WOOD stated that it was fully his intention to move that the money needed should be raised by a loan, unless he should hear something to change his opinion of the matter. Before formally moving that, it would be satisfactory to know the amount of the present debt.

The CHAIRMAN said the present debt was £10,109, and the £4000 to be raised would make it £14,000. £2000 would be immediately paid off, leaving £12,000; but, as representing part of that sum, the company had the houses recently purchased.

Mr. CHALMERS, after the explanation of the chairman, had much pleasure in moving the adoption of the report.

Mr. WOOD seconded the motion, which passed *nem. dis.*

Mr. POULTON moved the declaration and payment of a dividend for the half year at the rate of 5 per cent. per annum, clear of income-tax.

Mr. WAND seconded the motion, and it passed unanimously.

Mr. WOOD moved that the directors be authorized to borrow a sum, not exceeding £4000, to meet the present requirements. If they increased the number of proprietors their dividend would probably be at a smaller rate; and, therefore, if there was a prospect of paying off £1000 a year, it seemed to him the best course was to raise the money by loan. (Hear, hear.) He took it for granted that the money which had already been laid out on the works had brought them into such an efficient state, as that there was no reason to anticipate any great additional expenditure.

The CHAIRMAN remarked that the only additional expenditure would be in taking up mains of a smaller size and laying down larger ones.

Mr. WOOD inquired in what way the money would be raised—would there be power to diminish the rate of interest?

The CHAIRMAN replied that there would be always the power to pay it off. He (the chairman) was about to lend some money himself, and he should be glad to let the company off whenever they chose to repay him.

Mr. THOROUGHGOOD seconded the motion, and moved a vote of thanks to the directors generally, for their zealous and able management of the company's affairs; and to the chairman in particular, for his courtesy in the chair.

The motion, having been seconded, passed by acclamation.

The CHAIRMAN briefly responded on behalf of himself and colleagues, stating that the approval of the proprietary would stimulate them to exertion, and he hoped the company would continue to increase in importance and prosperity. (Hear, hear.)

Votes of thanks were cordially passed to the auditors and secretary, and, having been suitably acknowledged, the business of the meeting closed.

WOLVERHAMPTON GAS COMPANY.

The Ordinary Half-Yearly Meeting of the Proprietors of the Wolverhampton Gas Company was held at the Works in Horsley Fields, on Tuesday morning, the 25th ult. The attendance of shareholders was not very numerous. JOSEPH WALKER, Esq., chairman of the company, presided.

Mr. PROUD, the engineer of the company, read the following report of the directors:—

Agreeably with the requirements of the Act of Incorporation, your directors present to you their eleventh half-yearly report of the company's progress. The certified balance-sheet and statement of accounts for the six months ending the 30th of June last, show the expenses to have been £6802. 11s. 1d., and the income from gas rental, coke, tar, ammoniacal liquor, and used lime, £10,341. 5s. 8d., leaving an available balance of £3538. 14s. 7d. From this sum it is recommended that a dividend at the rate of 10 per cent. per annum be declared and made payable on and after the 2nd of September, and the residue, amounting to £91. 6s. 6d., to be placed to the reserve-fund, which will then stand at £570. 15s. 10d.

The reduction in the price of gas announced at the half-yearly meeting in February last has been accomplished, and the result has fully realized the anticipations which the directors then entertained. The consumers have had the advantage of reduced charges from the 1st of January. Your directors exercised bold policy in making the reduction at the time they did, as the dividend has been maintained chiefly by increased economy and vigilance in the several departments of the company's establishment.

The directors have the satisfaction to report that the question between this company and the Willenhall Gas Company, as to the supply of gas to Wednesfield Heath, has been amicably arranged by a mutual friendly policy pursued by the two companies. The Willenhall Company withdrew the clause in their bill embracing Wednesfield within their lighting district, and have agreed to finally retire from Wednesfield upon the completion of their contract with the London and North-Western Railway Company, which expires in December, 1858.

In conclusion, your directors have to assure you that they will continue to exercise their utmost endeavours to faithfully discharge the important duties which devolve upon them, and will carry out to the best of their ability that conciliatory and liberal policy which is absolutely essential for the successful development of every public enterprise.

On the proposition of the CHAIRMAN, seconded by J. BRADSHAW, Esq., the report was approved and adopted; and a dividend, after the rate of 10 per cent. per annum, was declared, payable on the 2nd of September.

The CHAIRMAN said that was the whole of the business, and he was not aware that he had any remark to make, nearly all present being as familiar with the business of the company as he was himself. For the board of directors, he could say that it was their intention to continue to conduct the business of the company with the economy and prudence they had hitherto exercised. He might also say that the whole body of the directors attended to the concerns of the company as zealously, and exercised as much vigilance in looking after the interests of the shareholders, as they could do if it were exclusively their own business.

A vote of thanks to the chairman and directors for their services during the past half year was then proposed by J. WOOD, Esq., who remarked that, on behalf of the shareholders generally, he was much obliged to them for the manner in which they had discharged their duties. The result of their efforts had been most satisfactory to every one. He was very glad that the measure referred to in the report, the reduction of the price of gas, had been adopted. He felt sure it was good policy. (Hear, hear.)

The Rev. G. STOKES seconded the motion, remarking that he thought the success of the concern a satisfactory proof of the soundness of the principles on which it was established, and of the ability with which it had been conducted.

The proposition was carried unanimously; and, in acknowledging the vote of thanks, the CHAIRMAN said the object of the directors was to give satisfaction to the public as well as the shareholders.

PUBLIC LIGHTING IN BRISTOL.

A Special Meeting of the Town Council, acting as the Bristol Local Board of Health, was held on the 18th ult.—the Right Worshipful the MAYOR in the chair—at which the committee of the local board reported that, the period of their contract with the Bristol and Clifton United Gas Company having expired, they had advertised in the local papers for tenders for a fresh contract for lighting the public lamps for a term of three years from the 27th of September next, and that they had received only one tender, from the same company. The committee, before advertising, after a careful investigation of the matter, had determined not to accept any tender without the sanction of the council, unless such tender should show a reduction of at least 20 per cent. from the present charges. Such reduction had not been made, and the committee therefore requested the instructions of the general board.

Mr. LANG inquired what was the total sum at present paid to the company?

Mr. HERAPATH said £11,760. 19s. 8d. was the total cost of lighting the public lamps, but out of this the gas company deducted a sum of £2549. 9s. 5d. as the cost of lighting, repairs, &c., making the amount received for gas only £9211. 10s. 3d.

The TOWN CLERK then read a clause from the board's Act of Parliament, by which any member of the board, being a shareholder in any company, was disabled from voting as a member of the board on any motion having reference to the interests of such company.

Mr. HERAPATH observed, that no member of the committee who was a shareholder in the gas company had taken any part in the discussion of the question, which had been brought before a sub-committee only.

Mr. W. NAISH, feeling himself placed in rather a peculiar position, as being both chairman of the local board and deputy-chairman of the gas company, wished publicly to appeal to Mr. Herapath if he had ever exercised any unfair influence over the committee?

Mr. HERAPATH said he thought he had included the chairman when he said all the members of the committee who were shareholders had abstained from taking any part in the question. (Hear, hear.) The sub-committee of the Local Board of Health, however, had felt that the gas company had not dealt so liberally with the city as they ought to. In past times, before the junction of the two companies, there had been something like a show of competition. Since the amalgamation there had been a total absence of all. The committee had thought that the gas company were favouring the public as individuals, whilst they kept the price up for the public as a community. (Hear, hear.) As a proof, they had gone into the question by a comparison with other towns. But there was one striking fact he would mention at once. The committee had found that when the price of gas to private consumers was 15s. per 1000 feet, the cost of a large-sized burner for one of the public lamps was £5. Now, the price was only 4s. per 1000 feet to private customers, or less than a third of what it formerly was, but the cost for one of the public lamps had only been reduced to £4. 4s. It was evident, therefore, the reduction had been nothing like in comparison. (Hear, hear.) The committee had thought it would be a fair mode to compare Bristol with Bath; the gas company in both cities got their coal at about the same rate, and what one could do ought to be done by the other. The committee found that the general burners in the Bath lamps burnt four feet an hour; the large-sized ones in Bristol burnt five feet an hour, or 25 per cent. more. The prices charged were £3 in Bath for the four-feet burner, and £4. 4s. in Bristol for the five-feet burner. The price here should of course have been but £3. 15s., £3 being to £3. 15s. as 4 was to 5. That was, Bristol paid 9s. more for each lamp than Bath did. Besides, the gas company in Bath was but a very small one, and the one in Bristol with an income of £50,000 a year, of course, had more opportunities of selling gas cheap. (Hear, hear.) The sub-committee therefore thought they ought to be charged at least as small a sum as in Bath. They would wish to give the gas company a fair remunerating income on their capital. That company had a capital of £180,000, with powers to borrow a considerable additional sum. He (Mr. Herapath) had in his hand a copy of the returns of the income and expenditure of the company, and it was on that he should found his remarks. In 1856 the company received for gas from private customers £33,329; for the public lamps they received £11,760, but then

they calculated the cost of lighting, repairs, &c., at £2549, which left for gas only, £9211, being over a quarter of the amount received from private customers. Out of their income of £50,824, £15,207 was put down as expended in coal; £10,083 as charges on trade; £1802 for wear and tear, and after all there was a balance of profit left of £17,936. After paying 9 per cent. interest on the total capital of £180,000, which would amount to £16,290, there would still be a balance of £1736 left out of that £17,936 profit. If 20 per cent. were taken off their charges to the city, it would only amount to about £2300. There was £1700 out of that sum for them at once, and they might be sure that the natural extension of the gas company every year would soon enable them to make up for the small remaining difference, and continue to pay a dividend of 9 per cent. The sub-committee, therefore, considered they were not asking too much when they sought for a reduction of 20 per cent. on the cost of lighting the public lamps. (Hear, hear.)

The MAYOR trusted the expression of the opinion of the committee would have some weight with the gentlemen of the gas company. He would not repeat the details that had been gone into by Mr. Herapath, but still he must remind them that when, in 1819, the price of gas to private consumers was 12s. per 1000 feet, the cost for a public lamp was £5. The 12s. had now been reduced to 4s., whilst the £5 had not sunk lower than £4. 4s. Was there anything like a proportion in that reduction? The first contract with the company, which was for 20 years, expired in 1840; a second was then entered into for 10 years, at the rate of £4. 12s. for each lamp, the price of gas to private individuals being then 9s. per 1000 feet. In 1850, a third contract was made, at the rate of £4. 4s. each lamp, the price of gas having then fallen to 6s. per 1000 feet. From that time to the present they had stopped at the £4. 4s. for each lamp, whilst the price to private consumers had gone down to 4s. per 1000 feet. He (the Mayor) thought the company must see that they, as the board, had a fair claim on them. In the return of the expenditure of the company there was an entry of £950 for bad debts. From the board they got no bad debts. (Hear, hear.) There was a charge also of £10,083 for "Charges on trade," in which, no doubt, there was a heavy amount included for collection, at 5 per cent. Now, they had nothing to pay for collecting from the board, for they always sent a cheque to the company. The company had also to examine the meters of private individuals eight times a year, with other charges which were not at all incurred by their lamps. He would assume that the company made £950 bad debts; he would put down the expense of examining the meters at £670; and collecting, at 5 per cent., £1666. These amounts came to £3286, the proportion of which on the amount paid by the board to the company would be £937. £9211 was paid to the company for gas only, and then they estimated the cost of repairs, &c., at £2549; the board had reason to believe that they could do it for much less. The gas company charged something like 16s. a lamp, whilst he (the Mayor) believed the board could do it for 12s. a lamp; the difference between which prices would amount to about £485. Those several sums would come together to £1422, which amounted to 12½ per cent. on their whole payment to the company. They were entitled, then, to a reduction of 12½ per cent. Besides, while in 1847 the company had to light only 1249 lamps, they had now 3237 to light—an addition of 1988, which, of course, involved a large increase of profit. In asking for a reduction of 20 per cent., the board asked for an abatement of a very slight amount, in comparison with what had been granted to private consumers. 20 per cent. off would require only about £500 more than what he had mentioned as over-charges. The company, being so prosperous a one, with £1646 left over, after paying 9 per cent. dividend, he thought the board might justly ask for the reduction they claimed. (Hear, hear.) He should submit that the subject be referred again to the consideration of the committee, and that they be requested to report again on it at the next meeting of the board.

Mr. BURROUGHS stated that he found the cost per lamp at Oxford was £2. 17s.; at Newport, £2; at Tunbridge Wells, £2. 5s.; at Weymouth, £2; at Yeovil, £2. 6s. 6d.; at Shaldon, £2. 7s. 4d.; while at Bristol it was £4. 4s. At Newport, too, the price of coals was 5s. a ton more than at Bristol.

Mr. VISGER said, if it were the meaning of the proposition brought forward that the charges paid by the public collectively ought to be reduced at the expense of the public as individuals, he was decidedly and diametrically opposed to that opinion. (Hear, hear.) He believed it was for the benefit of the community that there should be no distinction made. Since the introduction of gas, its consumption had been prodigious and progressive, and every endeavour ought to be made to encourage the public generally in the use of it. He could see no objection, perhaps, to a little reduction on the present prices; but, further than that, he protested against the principle of reducing the cost to any corporation, and increasing it to individuals. (Hear, hear.)

Mr. W. NAISH then rose, and said: It may be convenient for me to make a few remarks at this stage of the discussion. It is, perhaps, on every account desirable that the present tender for lighting the public lamps should be thus publicly discussed before the council instead of in the committee of the Local Board of Health. At any rate, it offers the gas company an opportunity of placing before the citizens of Bristol a statement of facts on a subject in which they are deeply interested, and on which much misapprehension is likely to prevail. (Hear, hear.) The gas company are perfectly ready to afford every information, being fully satisfied of the rectitude of their proceedings, and that their proposed charges are fair and equitable, and founded on sound commercial principles. The question alluded to by Mr. Visger seems to me to have an important bearing on the case. In the early days of gas lighting an unfair and vicious system was adopted by gas companies generally, in fixing their charges for public lights much lower than those made to the private consumer, the inevitable consequence being that the loss thereby occasioned had to be made good by the shopkeeper, housekeeper, and other private consumers. It has been well asked, is there anything analogous to such a custom in other branches of trade or manufactures? and what would be said of bakers or butchers if they agreed to supply hospitals, workhouses, or prisons, with their various goods much below their current rates, and then made up the difference by high charges to their private customers? (Hear, hear, and cheers.) This system is now acknowledged to have been unsound, and in some places advanced charges have been obtained. In Bristol the directors of the gas company, being desirous to correct the unfair inequality referred to in the way least likely to be felt by the ratepayer, have made, from time to time, larger reductions to their private customers than to the public lights, though, as I shall be prepared to show, important concessions have been made as regards a large number of these within the borough. But, while I speak of the directors, I would remind the council that in Bristol the manner of charging the public lamps is not exactly left to their discretion, but is defined and laid down by Parliament. In clause 32 of the Amalgamation Act, a clause which was either introduced by the city solicitors for the protection of the ratepayers, or approved by them before it was proposed in the committee of the House of Lords, it is provided as follows (the maximum price to the private consumer being also limited by the same Act):—"From and after the expiration of any existing contract or contracts for the supply of gas by the said dissolved companies, or either of them, to any lamp within the city and county of Bristol, the company hereby incorporated shall, on the request in writing of the local board of health, afford such supply from any main situate within twenty-five yards of any such lamp, at a price equal to the lowest price charged, for the time being, by the company to any private customer." Now, how have the Bristol Gas Company acted since the amalgamation? They are not afraid of the strictest investigation, for they have acted honestly throughout. Instead of dividing the dividends allowed them by law, instead of accumulating the amount of reserved fund allowed them also by Parliament, actuated by a desire to act liberally, and to keep faith with the gas consumers of Bristol, they have spontaneously, and without outward pressure, made reductions to their customers equal to 1-9th of their whole charge, while they also charge the gas supplied to the public lamps full 10 per cent. below the price required of them by the Act of Parliament. (Hear, hear, and cheers.) I will now notice a statement which has been alluded to by Mr. Burroughs, and which has appeared in various newspapers, of the annual charges made for public lights in towns there mentioned, this statement having no doubt deceived many, and made the Bristol price appear comparatively high, failing, as it does to make known some important particulars affecting the comparison; such, for instance, as that in many of these towns the number of hours in which gas was consumed was much fewer than in Bristol—(hear, hear)—that in some of them the lights were altogether extinguished on moonlight nights, while in others they were only lit for seven months, or other short portions of the year. (Hear, hear.) I hold in my hand this statement, and also a calculation, furnished me from the Bristol gas-office, from actual returns made from these towns, the result being in most instances in favour of Bristol charges for public lights, and without exception in favour of Bristol charges to the private consumer. (Hear, hear.) At Cirencester the annual charge per lamp is £3. 10s., which, for the quantity supplied by the Bristol Gas Company, would amount to £4. 11s. 3d.; the price charged to private consumers is 7s. per 1000 feet. At Gloucester the charge is £3. 8s. per lamp, which, in the same way, would work out to £3. 11s. 6d.; the charge to private consumers there is 5s. per 1000 feet. At Oxford the charge is £2. 17s. per lamp, which would work out £4. 14s. 3d.; the charge to private consumers is 5s. per 1000 feet. At Exeter the charge per lamp is £3. 7s. 6d., which would work out £4. 11s. 3d.; the charge to private consumers is 6s. per 1000 feet. At Southampton the charge per lamp is £4. 8s., which would work out £5. 6s. 6d.; the charge to private consumers is 5s. 6d. per 1000 feet. At Cowes the charge is £2. 15s. per lamp, which would work out £7. 6s.; the charge to private consumers is 7s. 6d. per 1000 feet. At Ryde the charge per lamp is £3. 10s., which would work out £3. 11s. 6d.; the charge to private consumers is 8s. 4d. per 1000 feet. At Weymouth the charge is £2. 10s., which would work out £3. 0s. 10d.; the charge to private consumers is 5s. 6d. per 1000 feet. At Yeovil the charge is £2. 7s. 6d., which would work out £6. 9s. 3d.; the charge to private consumers is 7s. 6d. per 1000 feet. (Hear, hear.) I stated just now, that important reductions had been made in the charges for public lamps within the borough. When our Local Board of Health first commenced operations, and before the passing of the Amalgamation Act, they applied to the two existing companies to light the outlying parts of the borough. At that time the companies were lighting similar districts at higher rates than those of the ancient city, for the obvious reason that these localities afforded less profitable return for capital expended in mains, &c., than the centre of the city, where the lights were comparatively numerous. The prices were then as follows:—Ancient city lamp, consuming 5 feet per hour, £4. 4s.; district of St. James, &c., lamp, consuming 4 feet per hour, £4. 10s.; Clifton lamp, consuming 5 feet per hour, deducting 6s. for lamp-post, since bought by the city, £4. 12s. The gas company at once reduced the price of the St. James and St. Paul district lamps to those of the ancient city, undertook the other outlying districts at the same rates, and placed Clifton on similar terms on the expiration of the existing contract. (Hear.) Now, when I tell you that the number of lamps undertaken on the new and liberal principle is 1862, against 1366 in the ancient city, I think I have proved my case, that a reduction, and not an inconsiderable one, has virtually been made. (Hear, hear.) I now come to the Bath case, on which so much stress has been laid, though I must at once protest against the unfairness of bringing one particular place against Bristol, while other places having an opposite tendency are withheld. (Hear, hear.) I admit that the charge per 1000 cubic feet to the public lamps in Bath is lower than in Bristol; but then let it not be forgotten that the price to the private consumer in Bath is 12½ per cent. higher than it is in Bristol; and probably the Bath private consumers have not much reason to hope for an early reduction where such low charges for the public lamps have been forced upon the company. Again, if the distance between each lamp in Bath and Bristol be compared, it will be found that in Bath it is from 30 to 40 yards; in the suburbs it averages about 70 yards, the average distance of the whole number being 45 to 50 yards, or say 38 lamps per mile of main. The average distance of Bristol lamps is 70 yards, or say 25 to the mile; therefore Bath pays for lighting the streets about £115 per mile, whilst Bristol pays £105—the gas company of Bath, of course, receiving a larger return on the expense of laying their mile of main than the Bristol Company; the illuminating power of the Bath gas, also, being but from 11 to 12 candles, while in Bristol our average is 13 candles and a large decimal, or nearly 14 candles. Now, when these statements with which I have troubled the council are fairly weighed, and when it is recollected that the contractors for lighting the public lamps are liable to heavy penalties for failing to do so for a single night during the period of the contract; that the waste sustained by the company in the supply of the public lamps is much greater than by that to the private consumer, for of course if a leak exist, it is much sooner discovered in a house than in the streets; that while many of the London companies have been advancing their prices, considerable reductions have been made in Bristol, I trust the council and the citizens generally will be convinced that the Bristol Gas Company is acting honestly towards them, and that their present tender is fair and reasonable. And, while fully admitting that it is the imperative duty of the council representing the ratepayers to use every legitimate means for lighting this extensive borough at the lowest possible cost, I must also declare my strong conviction that it has no right to secure an advantage to the ratepayers at the expense of a company, which it is too much the habit to regard as some rich abstraction, instead of being, as it really is, composed of numerous shareholders, most of them Bristol people, many of whom are poor, and have invested their small savings in the stock of this company, and whose interests it is the duty of the directors fairly to protect and maintain. (Hear, hear, and cheers.)

The MAYOR did not think the terms public and private had been used quite rightly, for the public were often put to great inconvenience by this

private company tearing up the streets for their mains. He thought the public, therefore, had some claim on the company for permitting them to do so whenever they liked. With respect to what Mr. Naish had said with relation to the fears entertained by some London companies that their prices were too low, he did not think gentlemen who received a 9 per cent. dividend need trouble themselves with the apprehension of their prices not being high enough. (Hear, hear.)

Mr. ROBINSON suggested that it would be better for the gentlemen to come to some arrangement with a smaller number in the committee-room than at present. He asked Mr. Naish whether it were correct that the price per 1000 feet to private consumers had fallen from 15s. to 4s., whilst the cost per lamp had decreased from £5 to £4. 4s.; and that that £4. 4s. was, according to calculation, at the rate of only 3s. 5d. per 1000 feet?

Mr. NAISH replied in the affirmative, adding that the tender sent in had been prepared by the directors of the company after mature deliberation.

Mr. SHAW remarked that they had always been told the question of the reduction in the price of gas depended on an increase in the consumption. The Mayor, it seemed to him, had made out a very clear case of a large increase in the number of lamps, and that the city had not been treated fairly in the reduction of the £5 per lamp only to £4. 4s.

Mr. NAISH said one great reason of the large reduction of the price to private consumers had been the introduction of the meter, which had enabled the gas company to detect the fraudulent burning that formerly went on to a great extent, and to make every one pay for what he consumed.

After a few observations from Mr. Cole and Mr. W. P. King,

The motion made by the Mayor, to refer the subject again to the committee, was carried.

THE GLASGOW GAS COMPANIES AND THE CORPORATION.

REJECTION OF THE PROPOSED PURCHASE OF THE GAS-WORKS BY THE COUNCIL.

At the Meeting of the Glasgow Town Council, held on the 20th ult., the discussion on the report of the deputation on the gas bills was resumed.

The LORD PROVOST said: In moving the adoption of the report by the deputation who were sent to London to oppose the two gas companies' bills, with a view to a purchase of both by the corporation, or to insist on such modifications in the clauses of the bills as might be beneficial to the public, I have to state that their report was brought before the large committee having charge of this business, when, after some discussion, it was deemed advisable to bring the whole matter directly under review of the council. It will be unnecessary for me to go over the whole of that document, now on the table, or to say more than that the deputation have,a strong feeling in favour of the council agreeing to purchase both companies, if this can be done on favourable terms for the community and our recommendation; and the motion I now make is that, "As a preliminary step, the deputation would suggest that a properly qualified and experienced gas engineer should be appointed to inspect carefully the works of both companies, and, with such assistance as may be necessary, to report to the council:—1. As to the precise extent of probable saving to the community which would be effected by the abolition of the existing companies, and placing the whole works of both companies under the direction of the magistrates and council as commissioners for the inhabitants at large—classifying the particular items of saving under special and definite heads. 2. As to the present state or condition of the works and properties of both companies, with an estimate of the intrinsic worth and value of such works and properties. 3. As to the financial condition of both companies, with a statement of their pecuniary assets and liabilities, &c." When this proposal of acquiring both gas companies was brought up twelve months ago, it was favourably entertained by the council. A committee was appointed to negotiate. This was continued for some time; and although there was not a very wide difference between the parties, the terms could not at that time be adjusted. When, recently, both companies proposed to go to Parliament for additional powers, the matter was again brought before the council, and it was considered advisable to renew negotiations by the appointment of another committee. At the same time, the council unanimously approved of a purchase of both works, if this could be done on reasonable terms. This resulted—on a favourable recommendation by the committee, and a belief that there was a hope of coming to terms—in the appointment, unanimously, of a very large committee, with full powers to deal with the whole matter. This large committee, after mature deliberation, agreed to empower the deputation to conclude a bargain, if the works could be had for £600,000, or 4 per cent. fixed perpetual annuity on that amount. The report narrates that the deputation could not arrange on these terms, but that they considered it advisable to make contingent agreements with both companies, subject to your approval, by which they are to pay £624,000, or 4 per cent. annuities on that sum, five years being allowed to pay up that amount, if the shareholders should prefer money rather than annuities. At the same time, it was agreed, before you determine as to any agreement, that you were to have full power to examine, in terms of my motion, as to the real value of the works, and the state of their accounts. The difference between the offer made and what the two companies ask is only £24,000 on £600,000, not a great matter on such a transaction, if the works are found to be worth that sum. It is, I hope, not necessary for me to go over the advantages the community would derive from the supply of gas being in the hands of the corporation. This has been so fully stated on former occasions—it is so universally admitted by every competent authority—and is so fully explained in the report, that I have nothing to add except that we are convinced the saving and benefit to the public would ultimately be very great. In a sanitary point of view, the Government Commissioners, and all who have studied the subject, say that water and gas ought to be in the hands of corporations. Two of the greatest evils we have to contend with in large communities are dirt and darkness: with water you can wash away the first, and with light you can dispel the latter. Water and gas are the right and left arms of any police, and had we the supply of the gas as we now have of the water, it would give us an additional claim to the title of being a model municipality in respect of self-government. I do not, however, wish the council to go into this transaction, either on the terms offered or any other, without full examination and a report, in terms of my motion. All I ask is for you to endorse your own repeated and unanimous votes, that you thought it wise that this should be in the hands of the corporation, if it should appear, after a careful and scrupulous examination, that it was a good bargain. I therefore ask you to adopt the report of the deputation, so far as to sanction the appointment of parties who will ultimately report to you on the position of these works. Whether you refuse the present terms or adopt the report, this may serve as a basis for further negotiation, and be a most valuable and useful volume of reference for the Town Council in all time coming. Just now we have two gas companies, and I look forward in time to our having three. These must be dealt with by the Town Council now or hereafter, and there never was a more fit opportunity than this for that purpose. They have a right to give us every explanation with respect to their position, and you will then be able to judge whether it will be wise to proceed farther—failing which, the information acquired will be extremely useful in guiding the Town Council when dealing with such a question again.

Mr. BRYSON seconded the motion.

Mr. GRAHAM supported the motion, and in doing so remarked that two gas companies were more than enough, and unless these were purchased the city would be subjected to a third, the result of which would be that between them they could fix the price of gas at any amount they pleased.

Bailie CLOUSTON opposed the motion, and moved as an amendment that the council approve of the report, except in so far as it aimed at the purchase of the gas-works, or recommended measures leading to the purchase; and that the council take no further steps towards it. It appeared that, instead of £600,000, no less than £680,000 would be required to purchase those works—a large sum, no doubt, but if he saw the purchase would be expedient, he would not scruple paying it. However, he saw no good that would result to the community; for the gas with which the city was at present supplied was excellent in quality, it was in sufficient abundance, and it could not well be cheaper; while, on the other hand, if the corporation saddled themselves with the bargain contemplated, they would be obliged to raise the price of gas from its present low rate of 4s. 7d. per 1000 feet to 5s. But by the time the council would be in a position to purchase the works, the company would demand £800,000; and let the council suppose that by that time a new light might be invented that would supersede gas in quality and cheapness, where then would be the £800,000? or what use would the gas-works be then? (Laughter.)

The LORD PROVOST: Oh! that is surely only raising a phantom to frighten us.

Mr. GEMMILL seconded the bailie's amendment, and commented on the hurried manner in which the Lord Provost had brought on the motion appointing the committee on the gas bills, the usual notice not having been given.

The LORD PROVOST: Let me correct you, sir. This matter was before a committee of the council that reported on it; and it was on that report that I moved for a larger committee, with additional power to deal with the bill. The subject had been long before under discussion, and there certainly was no hurry in the way the committee was formed.

Mr. GEMMILL proceeded to say that the committee had been formed owing to the representations of the Lord Provost, that immediate measures should be taken to purchase the gas-works; and, after some conversation, and with very defective information before them, the committee were induced then to send a deputation on the subject to London, with certain instructions as to the sum to be paid for the works; and he argued that the terms arranged upon by the committee had been overstepped by the deputation. He saw no good that could arise to the city from the purchase; and he reminded the council that, even supposing the works to be flourishing in their possession, still the surplus money derivable from them could not be applied to general purposes, but should be confined altogether to the works. Referring to the fifth article of the agreement drawn up with the Glasgow Company (as follows:—The profits of the company for the year from May 31, 1856, to May 31, 1857; and for the year from May 31, 1857, to May 31, 1858, shall belong to, and be distributed as dividend among, the shareholders; the profits for the last of these years being hereby fixed at £15,000, whether the same shall prove to be more or less than that sum, the difference being placed to the credit or debit, as the case may be, of a new suspense account), Mr. Gemmill said, that if this was sanctioned, of course the council came under the obligation to pay them.

The LORD PROVOST: My motion does not go so far as that.

Mr. GEMMILL: The council came under the obligation of paying that £15,000 whether they realized it out of the profits on the gas or not; and this brought him to the state of matters as shown by the company's own report. Last year they did not make £15,000, but only £14,000 nominally. They made out 10 per cent., which was equivalent to £15,000, but from that was deducted the income-tax. And even this £14,000 was not made by the company last year, for they really made no more than £9113, and they took from their rest of £24,000 in bank a sum of £4887, which they added to the £9113. Thus, the council saw a large deficiency of the company's profits last year, and he could show that the deficiency in the present year would be much greater. Last year the price of coals was 16s. 2¾d. per ton, while now it had increased to 18s.; and as at least 50,000 tons were required, the absolute loss of the company would be, in round numbers, £5000, which, added to the former deficiency, would make a total loss of £9887. Supposing a similar deficiency to happen in the new company, then the council would sustain a loss of £19,774 to meet which, the raising of an assessment would not be adequate.

The LORD PROVOST: But you misunderstand my motion. It does not bind the council at all to the purchase.

Mr. GEMMILL proceeded: By the 18th section of the Act, the maximum rate for gas was fixed at 5s. 8d.; and supposing the council to have taken the works, even the raising of the price of the gas from its present low rate of 4s. 7d. to the maximum of 5s. 6d. would not make up the deficiency that he had pointed out; and he need hardly say that to raise the price would be to expose themselves to considerable obloquy. But, in any case, the loss for the current year should be made up to the company from the corporation funds.

Mr. BRYSON rose to order. The statement Mr. Gemmill was making appeared to him to be uncalled for at this stage of the motion, the question before the chair being whether the report should be remitted to committee or not.

Mr. M'DOWALL: And he is only giving his reason why it should not.

Mr. GEMMILL: That was all, and he was quite entitled to do so. It would appear from the report that both gas companies had expended much more than their capital. The Glasgow Company had expended £24,217 beyond its capital, and the new company £30,000. In other words, they had spent between them £54,217 out of the £100,000 to which they were entitled by the Act; and on this extra expenditure there was no dividend paid. Debts, in the shape of tradesmen's discounts, to the extent of £14,218, were also incurred; which sum, added to the £54,217 of over-expenditure, made up £68,435, leaving a balance to be expended of only £31,565 out of the £100,000 authorized by the Act—a balance totally inadequate, the council would see, to make up the deficiency to 10 per cent. There was another difficulty with which they would have to contend, viz., the raising of the sum of £800,000 to pay those people in five years. Now, in reference to this he would observe that, though these gas establishments were usually looked to as first-class securities, he had it on the authority of a highly confidential person, that they were actually paying 6½ per cent. for money borrowed from the bank. What advantage would the city gain from such a state of things being transferred to the shareholders of the council? As matters were at

present, the public had no reason to be alarmed. The gas they were getting could not be better in quality, the price was moderate, and restricted to 5s. 6d. per 1000 feet under any circumstances. He saw no necessity, therefore, for the council entering into mercantile transactions, and becoming manufacturers of gas. Were it possible to make a surplus fund of £10,000, or something like that, from the business, and had the council sufficient power to allocate such money to general improvement purposes, he would certainly advocate the purchase of the works; but, as the first of these things could not happen, and the other could not be permitted even if the first did occur, he must give the motion of the Lord Provost his strenuous opposition. His lordship had recommended that engineers be employed to examine the works; and they all knew that meant the bringing from London a number of men, who would talk a great deal of nonsense and cost them a large sum.

The LORD PROVOST: I never said the engineers were to come from London.

Mr. GEMMILL: No; but they all knew the sort of people, and where they would come from. But, assuming the gas-works to be in first-rate working order, and incapable of further improvement, and that the financial statements of the companies were accurate to a farthing, still he could give no countenance to the motion. The very investigation of all this would involve considerable expense, and were they to throw away the money unless they were first of all prepared to take the works? The companies would not, he was quite sure, abate their demands by one farthing. He would, therefore, advise the council not to spend money on such investigations as that proposed. They had had fruitless expense enough in such matters before to learn to avoid it now. He found that, instead of the £40 or £50 it was said the services of the engineers would amount to on a late occasion, they actually came to more than £2000. So long as he could, therefore, he would oppose the measure, not only in the council-room, but elsewhere, to the last moment—("Hear, hear," from Mr. Taylor)—and he felt it to be his duty, as a member, to second the amendment, trusting, as he did so, that the rest of the council would be wise enough not to commit themselves by any such half measure as that proposed in the motion, which they ought unanimously to reject.

Mr. GRANT asked whether, if the council supported the motion to appoint engineers and accountants to inquire into the condition of the works and the state of the accounts, they would be bound to take the works on the terms of the agreement? If they were so bound, he would oppose the motion, for he agreed with Mr. Gemmill that the terms of the agreement were not such as the deputation were authorized to come to.

The LORD PROVOST explained that he did not consider the council in any way bound by the report of the deputation. He believed that when the deputation were in London, the three members of it were informed by the company that they were not to be held bound, but that the council should have four months to consider the question.

Mr. WHYTE asked, were not the council bound to take the works in the event of the report of the engineer and accountants proving satisfactory?

The LORD PROVOST: Certainly not.

Mr. WHYTE held that the council in such a case would be bound in honour to take the works on the terms of the agreement as already submitted. He had heard that inquiry from several parties, and the reply was as he stated.

The LORD PROVOST held that the agreement spoke for itself, showing that the question was entirely open between the Town Council and the shareholders.

Mr. GEMMILL entertained the opposite opinion, and for that very reason he refused to subscribe to the agreement in London.

Mr. DREGHORN said he was surprised at the opposition the measure met with from Mr. Gemmill and Bailie Clouston, and he taxed both gentlemen with having unwarrantably withdrawn from it their former support. As to the debt of the company, their floating capital would make up the deficiency in that respect.

Bailie CLOUSTON said that if the bargain were likely to be advantageous, he would have paid £600,000; but the fact was that they would have to pay £670,000, with the debts.

Mr. DREGHORN: Even supposing this assertion were true, which it is not, I cannot understand what objection there could be in paying 70,000 more. If it were good as a £600,000 transaction, it could not be much worse at £670,000; it would, at least, be one that would entitle you to investigate. Mr. Dreghorn then proceeded to defend the agreement drawn up by the deputation, and to argue that the speculation would be most advantageous to the community.

Mr. TAYLOR protested that he could not see in what the alleged advantages could consist. The movement did not emanate from the great body of shopkeepers, who were the great consumers of gas, but it had arisen from a few individuals. The public were quite satisfied with the gas with which they were supplied, and the price was sufficiently moderate. Therefore, as he could see no reason for the movement, he begged to support Bailie Clouston's amendment.

Mr. M'DOWALL suggested, in accordance with a standing order precluding the disposal of motions involving sums of more than £50, and for other reasons, that the discussion and voting on the question be delayed.

Bailie WRIGHT supported the amendment of Bailie Clouston, considering that if the council proceeded farther in the matter they would be bound to carry out the agreement.

There were then loud cries of "Vote, vote."

The LORD PROVOST, alluding to the alleged hurry in which the question was brought before the council on the former occasion, said that for the 15 years during which he had been a member, the purchase of the gas-works had been the subject of discussion, and that it had been frequently nearly accomplished. Various committees had been appointed from time to time to consider the question, so that there could have been no undue precipitation in the manner in which it was last brought before the council. The matter was then fully gone into, with the exception of the terms of the purchase, which it was not deemed prudent at so early a stage of the proceedings to mention while reporters were present; but it was agreed that a large committee should take the matter up, which was accordingly done. Gas was nearly as necessary as water, and in treating of a public commission, instead of a private company, for supplying towns with water, the Royal Commissioners, in their second report, printed for the use of both Houses of Parliament, *inter alia*, state that "it appears to be generally admitted by witnesses examined before us, who, being themselves connected with existing water companies, have had every opportunity of observing the effect of the opposing interests of the companies and their customers, that a copious supply of water cannot be secured to the poorer classes of the community unless the duty of providing it is placed under the management of some independent and disinterested body. . . . . The investment of a second capital in the same field brings with it the necessity of maintaining separate establishments, each with its own staff of officers, for the superintendence and management of works even in the same streets, and the causes of leakage of water, and other losses from wear and tear, are multiplied in the same proportion. The mains and pipes—the great source of expense when once laid down—are irremovable, except at a further cost. By the introduction of competition this fixed capital either becomes totally unproductive, or the returns are diminished by a reduction in the number of consumers. A large portion of the capital invested in this superfluous and great exertion, by reduction of price and liberality of supply, must be made to obtain public patronage. The dividends of the competing companies are proportionally decreased; and, when both probably are on the verge of ruin, an arrangement is made to withdraw the competition. The public is thus deprived of the expected advantages, and is again exposed to the high charges generally accompanying a monopoly. The operation of the existing laws in those respects is well illustrated in the evidence of Mr. Hawksley and Mr. Quick, and in the memorial which has been forwarded to us from two of the water companies in London. The former witness has furnished us with a table drawing the rate at which the expense of the establishment and the charges for maintaining the works of the water company at Nottingham decrease in proportion to the quality of water supplied. From this statement it appears that the cost of supplying 1000 gallons, exclusive of the interest on capital, amounts to 1·42d., or little less than 1½d., and with the interest on capital it is only 3d.; the charges which increase with the quantity supplied (being those connected with the pumping machines) bear a proportion of one-third only; and the remaining two-thirds (comprising the salaries of officers, the general cost of the establishment, and the repairs of the building and works) will diminish, though in different ratios, as the quantity of water supplied is increased. The same principle is exemplified even more strongly in the case of establishments for the supply of gas. . . . . We recommend that, on the establishment of new companies, it be made a condition that the local administrative body be enabled to purchase the works after the lapse of a certain number of years upon certain terms, and upon a rate of interest to be fixed; and that, with a view to economy, competition between water companies be discouraged as much as practicable." His lordship, after some further remarks by way of reply, concluded by pressing his motion. (Cries of "Vote, vote.")

Mr. GOVAN moved the standing order in opposition to the disposal of the question at the present meeting, but the objection was overruled on the ground of being made at too late a stage of the proceedings.

The Lord Provost's motion and Bailie Clouston's amendment were then put to the vote. The result was as follows:—For the motion—the Lord Provost; Bailies Thomson and Galbraith; Messrs. Robert Bryson, George Coventry Dick, David Dreghorn, James Graham, George Grant, jun., David M'Kinlay, and James Playfair—10. For the amendment—Bailies Wright, Hannan, and Clouston; Deacon Convener; Messrs. Thomson Aikman, William Allan, John Binnie, Thomas Boyd, James Brown, James Couper, John Fleming, Andrew Fowler, Andrew Gemmill, William Govan, jun., William Hutchison, James Moir, William Macadam, Samuel M'Culloch, John M'Dowall, Robert Neill, William Rae, James Taylor, John Ure, Robert Webster, Thomas Whyte, and William Whyte—26.

The amendment was accordingly declared to be carried.

The council then adjourned.

ROTHERHAM GAS COMPANY.—It will be recollected that at the last annual meeting of the above company there was some discussion as to whether the number of directors should be nine or seven. Mr. Potter, solicitor, was in favour of nine being appointed; but seven was the number fixed upon by the meeting. Subsequently, Mr. Potter, believing nine to be the legal number, took proceedings in the court of Queen's Bench to enforce the appointment of this number. He had accordingly obtained a rule *nisi*, and notice was sent to the directors in the usual form that at the beginning of next term they would be called upon to show cause why a mandamus should not issue, compelling them to elect two more directors. Under these circumstances the directors called a special meeting of the shareholders, which was held on the 5th ult., to decide what course should be taken. Mr. Potter explained that his object in taking law proceedings to compel the appointment of two more directors was because nine was the legal number, and because he believed it was for the interest of the shareholders that nine should be appointed. Several shareholders condemned Mr. Potter's conduct in throwing upon the company the expense of law proceedings; but it was intimated that the directors would have no objection to the appointment of two more to their body if that was the legal number. Mr. Potter said that if two more directors were appointed he should be satisfied with the payment merely of costs out of pocket; and a resolution was passed empowering the directors to settle the matter as they thought fit.—*Sheffield Times.*

BURY GAS COMPANY.—The following half-yearly report has been issued by the company:—

The directors have the pleasure to report that the present position of the company is satisfactory.

The revenue receipts for the past half year have been amply sufficient to justify the payment of the usual dividend.

The directors will, therefore, recommend the payment of a dividend (free from income tax) of 10s. per share.

The directors have to report that, pursuant to the authority given them at the special meeting held on the 13th day of March last, they have borrowed on mortgage the sum of £1500, at the rate of 5 per cent. interest.

That the sum so borrowed will not be sufficient to pay the whole cost of the late enlargement of the coal shed and the erection of the new gasholder now in course of erection.

That the borrowing powers of the company have now been exercised to the full amount authorized by their special Act.

The balance-sheet to the 30th of June has been duly examined and reported upon by the auditors.

BANBURY WATER COMPANY.—The whole of the contracts for these works are now taken, and we understand they are within the estimates of the engineer, Mr. J. Hodgson Jones, of Westminster. The tenders were made out on quantities taken out by a surveyor nominated by the contractors. The following are the parties who have obtained the contracts:—For reservoir and engine-house, Messrs. Davis and Sons, Banbury; steam-engine and pumps, Mr. Charles Lampitt, Neithrop; filter-beds and pipe-laying, Mr. John Aird, London; sluice cocks and hydrants, Messrs. Guest and Chrimes, Rotherham; supply of mains, the Butterley Company, Alfreton, Derbyshire. Some of the tenders are necessarily upon schedules of prices, and therefore the amounts cannot be given until the quantities required are ascertained.

Price Current.

CASTINGS, per Ton.

Average Weight of Cast-Iron Gas-Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	4 10 0	3 11 9	3 13 0	4 0 0	4 10 0
1¼ and 2 inches Socket Pipes	8 0 0	7 5 0	7 10 0	7 15 0	7 10 0
2¼ and 3 „ „ „	7 10 0	7 0 0	7 5 0	7 10 0	7 5 0
4 and 5 „ „ „	7 10 0	6 15 0	7 0 0	7 5 0	7 0 0
6 in. & upwards „ „	7 5 0	6 10 0	6 10 0	7 0 0	6 10 0
Retorts, 1st fusion, hot blast	7 0 0	...	7 0 0	7 5 0	7 0 0
„ 2nd „ cold „	8 0 0	...	7 5 0	7 10 0	7 5 0
Tank Plates, ¼ thick and above	7 10 0	6 15 0	7 0 0	7 5 0	7 0 0

COALS.

NEWCASTLE. Unscreened.	s. d.	
Whitwell Primrose, Burnhope	6 0	per ton
Pelton and Medomsley	6 6	„
Pelaw	6 9	„
Eighton Moor, New Pelton, Peareth, South Pelaw, Washington Hutton, & South Peareth	7 0	„
Ramsay's Newcastle Cannel	15 0	„

SCOTCH CANNEL.	per ton.
Boghead, at Leith	32s. 0d.
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
„ 2nd „	12 6
Lesmahago, at Glasgow	25 0
„ „ Leith	27 6
Arniston	22 0
Wemyss	20 0
Knightswood	18 0
Pirnie	15 0

SUNDRIES.

Best Newcastle fire-bricks	60s. per 1000	Welch bar iron, in London	£8. 10s. per ton
„ „ „ clay	12s. per ton.	Foreign spelter	£30. 10s. „
Cliff's fire-bricks at Wortley,	57s. 6d. p. 1000	English block tin	£140 „
Tough cake copper	£121. 10s. per ton.	Banca „ „	£144 „
English pig lead	£24. 10s. „	Tarred rope yarn	26s. per cwt.

WROUGHT-IRON TUBING, subject to 40 per cent. Discount.

	2 inches.	1½ inch.	1¼ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 2 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
„ „ „ 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows—wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
„ with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	

FREIGHTS, per Ton.

Coastwise—Newcastle.		*Foreign.*	
Chatham & Roches-	6s. 0d	Boulogne	8s. 0d
Cork [ter	10 3	Barcelona	25 0
Dover	6 6	Bordeaux	16 0
Dublin	10 9	Cadiz	19 0
Exeter Quay	9 0	Calais	8 0
Folkestone	6 6	Dieppe	9 0
Hastings	7 6	Genoa	26 0
London [mouth	6 3	Hamburg	9 3
Lowestoft & Yar-	4 6	Havre	10 3
Lynn	5 0	Leghorn	24 0
Portsmouth	8 0	Lisbon	18 0
Plymouth	8 9	Rotterdam	8 0
Whitstable	6 0	Stettin	13 0
Weymouth	8 0	Trieste & Venice	30s. to 33s.

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After the cloth was removed, several toasts were given, principally indicative of the great regret which every workman felt at the resignation of A. A. Croll, Esq., whose uniform kindness and liberality has most justly and deservedly endeared him to every one connected with the works—two of his many kind acts being to give two days' excursion, with provisions to the workmen and their wives, yearly. Also, a large joint of meat to every one employed at Christmas.

The band, composed by the company's workmen, and conducted by Richard Carpenter, played several lively and appropriate airs, and each one retired home at an early hour, with (if possible) deeper feelings of gratitude to their late kind and generous benefactor.

The whole was ably and efficiently conducted by Mr. William Scoble, the late Foreman of A. A. Croll, Esq.

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Wrought Iron, Composition, and Tin Tube,

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ALWAYS IN STOCK.

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IN EVERY VARIETY, WHOLESALE AND FOR EXPORTATION.

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one of which answers the purpose of THREE ordinary Valves, in connecting Purifiers, or in shutting off and passing a Station-Meter, or other apparatus. Also his

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by which any number of Retorts, up to Twenty, can be heated by one Coke and one Tar Fire, reducing the fuel account in many instances to one-half of what it now is, and without the production of any smoke.

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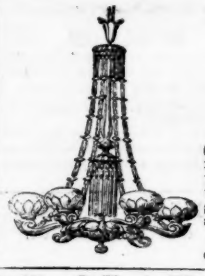

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